


1928

Architecture, Building and Furniture Trades: Time Table and Prospectus of Courses 1928-29

City of Dublin Vocational Education Committee

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1928-29.

ÁRD-ŠAORISE AGUS POIRŠNEOIREAČT.

CLÁR NA ŠCÚRSAÍ.

SRÁID BOLTÚIN.

ARCHITECTURE, BUILDING

AND

FURNITURE TRADES.

Time Table and Prospectus
of Courses.

BOLTON STREET.

City of Dublin Municipal Technical Schools.

BOLTON STREET TECHNICAL INSTITUTE.

SCHOOL OF MECHANICAL AND MOTOR CAR ENGINEERING.

SCHOOL OF ARCHITECTURE AND BUILDING TRADES.

SCHOOL OF BOOK PRODUCTION AND PRINTING TRADES.

KEVIN STREET TECHNICAL INSTITUTE.

SCHOOL OF ELECTRICAL ENGINEERING.

CHEMISTRY, PHYSICS, AND WIRELESS TELEGRAPHY.

ART, ART CRAFTS AND MISCELLANEOUS TRADES.

SCHOOL OF DOMESTIC SCIENCE.

PARNELL SQUARE TECHNICAL INSTITUTE.

SCHOOL OF COMMERCE.

SCHOOL OF DOMESTIC SCIENCE.

CHATHAM ROW.

MUNICIPAL SCHOOL OF MUSIC.

NOTE.—The General Prospectus of the Technical Schools is divided into eight parts, issued separately in booklet form. Each booklet is complete as regards the arrangements, Time Tables, Syllabuses, etc., of the particular Department and classes dealt with. The following is a list of the booklets :—

- No. 1. MECHANICAL AND MOTOR CAR ENGINEERING AND ALLIED TRADES.
- No. 2. ELECTRICAL ENGINEERING, WIRELESS TELEGRAPHY, PHYSICS AND CHEMISTRY.
- No. 3. ARCHITECTURE AND BUILDING TRADES.
- No. 4. BOOK PRODUCTION AND PRINTING TRADES.
- No. 5. COMMERCE.
- No. 6. DOMESTIC SCIENCE.
- No. 7. ART AND ART CRAFTS AND MISCELLANEOUS TRADES.
- No. 8. SCHOOL OF MUSIC.

Copies of any of the booklets may be had at any of the Technical Institutes, at the Public Libraries of the Corporation, or by post (2d.) from the Offices of the Technical Schools.

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SCHOOL OF ARCHITECTURE, BUILDING, AND FURNITURE TRADES.

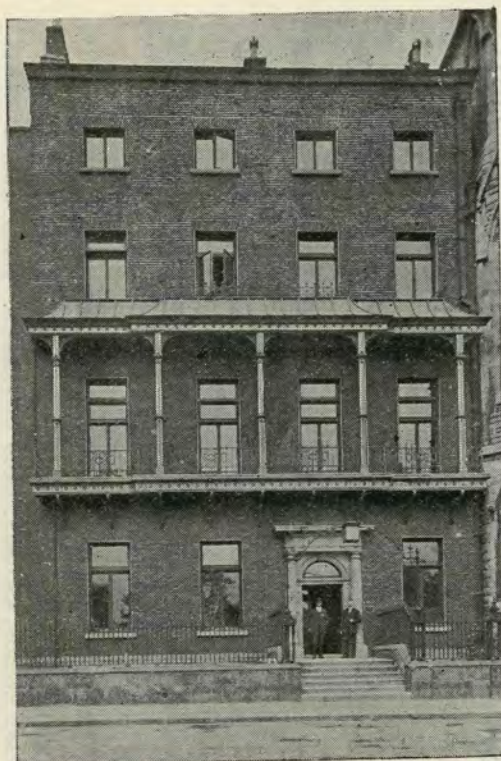
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BOLTON STREET TECHNICAL INSTITUTE.



KEVIN STREET TECHNICAL INSTITUTE.



PARNELL SQUARE TECHNICAL INSTITUTE.

Sgoileanna Ceáir agus Ealaídan, Baile Átha Cliath.

CITY OF DUBLIN MUNICIPAL TECHNICAL SCHOOLS.



LOUIS ELY O'CARROLL, B.A., B.L.,
Principal Executive Officer.

EDWARD MORTON, A.R.C.S.I., A.I.C.,
*Head Teacher of the School of
Physics, Electrical Engineering and
Chemistry.*

JOHN C. MACGUIGAN, B. Comm.
(N.U.I.); *Headmaster of the Parnell
Square Technical Institute, and
Head of the School of Commerce.*

WILLIAM DAVIDSON, F.B.I.C.C.,
*Head Teacher of the School of
Architecture, Building and
Furnishing Trades.*

ERNEST E. JOYNT, M.I.M.E.,
*Head Teacher of the School of
Mechanical and Motor Car
Engineering.*

WILLIAM H. JOHNSON,
*Acting Head Teacher of the School
of Book Production and Printing
Trades.*

MISS KATHLEEN O'SULLIVAN,
*Head Teacher of the School of
Domestic Science.*

W. L. WHELAN, Headmaster of Arts and Crafts.

ARTHUR DARLEY, Director, School of Music.

COUNCIL OF STUDIES.

The Council of Studies will consist of the Principal Executive Officer and the Heads of the several departments. For Examinations, representatives of the Part-time Teaching Staff, Employers' Associations and Trade Unions will be included.

All enquiries or communications should be addressed to the Principal Executive Officer, Technical Institute, Bolton Street.

SESSION 1928-29.

CALENDAR and MEMORANDA.

1928

- Mon., 3rd Sept.** Day Apprentice School resumes.
- Wed., 5th Sept.** First Term, School of Music, begins.
- Mon., 17th Sept.** Entrance Examinations and Enrolment of Students for Day and Evening Technical Classes begin.
- Mon., 24th Sept.** Instruction in all Technical Classes begins during this week.
- Thurs., 20th Dec.** Final Meeting of Classes before Christmas.

1929

- Wed., 2nd Jan.** Classes resume after Christmas.
- Mon., 14th Jan.** Second Term, School of Music, begins.
- FEBRUARY** Entries for Public Examinations are made about the end of this month. Exact dates will be notified to the Classes.
- Wed., 27th March** Final Meeting of Classes before Easter.
- Mon., 8th April** Classes resume.
- Fri., 10th May** All Evening Classes close except Special Classes preparing for Examinations.
- Sat., 11th May** School of Music closes.
- Fri., 26th July** Day Apprentice School closes.

Preface.

The City of Dublin Municipal Technical Schools were founded in October, 1887, as an outcome of the Artisans' Exhibition held in the City in 1885. The Schools were originally housed in an historic but unpretentious building in Kevin Street. From the foundation, and practically without interruption, the record of progress and expansion has been continuous, and now the Schools occupy three very large Technical Institutes at Bolton Street, Kevin Street and Parnell Square, and several classes are accommodated in other buildings throughout the City, affording in all accommodation for upwards of 5,000 students.

CURRICULUM.

The present curriculum of the Schools provide complete Courses of Instruction in

Mechanical Engineering and Allied Trades.
Electrical Engineering and Allied Trades.
Radio Communication.
Motor Car Engineering.
Locomotive Engineering.
Naval Architecture.
Architecture, Building Trades and Furniture Trades.
Book Production and Printing Trades.
Applied Chemistry.
Botany, Materia Medica, and Pharmacy.
Art and Art Crafts.
Music.
Commerce.
Domestic Science
Catering Industries.
and numerous Miscellaneous Trades.

EVENING COURSES.

Evening Courses are provided in all the subjects outlined above, and enable those engaged in the day-time to acquire an intimate knowledge of the principles that underlie the processes carried out in their daily work.

DAY COURSES.

Day Courses and Classes are arranged in most of the Departments of the Schools. The DAY APPRENTICE SCHOOL provides whole-time two years' Courses in selected trades for boys who have just left school. The Day Trade Dressmaking Course provides similar training for girls, and Day School of Commerce a whole-time training to boys and girls.

Special Day Courses are provided for those actually engaged in trades—arrangements being made with employers whereby their apprentices can attend the Schools during part of several days each week. At present it has only been possible to arrange such Courses in a few cases—notably Painters and Decorators and the Printing Trades—but it is hoped, with the co-operation of the employers, to gradually extend this system to all trades.

ARRANGEMENT OF COURSES.

The Courses in all Departments, both Evening and Day, are arranged progressively to cover from two to five Sessions, according to the nature of the subject. The Courses in general include two or more subjects bearing on the main subject, and the instruction is given in such a manner as to illustrate the application of the principles of Science and Art to the daily work of the students.

ADVANCED WORK.

The Laboratories and Workshops of the Schools are very completely equipped with the best and latest apparatus and machinery, and senior students are given every facility for advanced or research work.

NEW CLASSES.

If it can be shown that there is a demand for a new class, the teacher and requisite equipment will be provided.

LECTURES.

Special lectures of a popular nature will be given during the Session.

CINEMA.

A complete cinema installation has been provided in the Technical Institute, Bolton Street, and films of an educational nature will be shown from time to time. These displays will be duly notified to students in their classes.

DEBATING SOCIETY.

Students of the Technical Schools are eligible for membership of the Debating Society. Annual subscription, one shilling.

ENTRANCE EXAMINATIONS.

In the present year Entrance Examinations will be held at the Bolton Street, Kevin Street, and Parnell Square Technical Institutes, every evening during the week commencing 17th September, and on as many evenings afterwards as may be necessary. All new Students are advised to attend at 7.0 p.m. Those who can produce the Junior or any Higher Grade Certificate of the Intermediate Education Board, or the Higher Grade Certificate of the National Board, or some equivalent Certificate, need not sit for the Entrance Examination, and should make application for admission early in the Session.

The Entrance Examination consists of easy papers in English, Arithmetic, and Elementary Drawing, and First and Second Class Passes will be awarded. Those who pass in the First Class are eligible to take any Specialised Course.

These Examinations are not obligatory for trades' students.

SPECIALISED COURSES.

The Official Specialised Technical Courses are open to all Students who pass the Entrance Examination in the First Class, or are otherwise qualified. Each one is to take up, under advice or approval, the particular Course which most nearly meets his requirements, and is to adhere to this definite programme without any subsequent variation. If he ceases to attend any component subject of this Course he is liable to forfeit his entire Ticket.

No Student may attend for more than two Sessions in any one stage of the same subject.

Teachers, Pupil Teachers, and Monitors may enter for Special Courses that suit their needs, apart from the Official Courses. Such a Course will be regarded as an Official Technical Course. The same privileges will apply to Students whose needs are not met by the Official Courses. In their case the Course Subjects must be arranged and sanctioned by the Head Teacher.

The stage of any subsidiary subject may be changed to fit the Student's particular grade of knowledge, the special evening allotted to Laboratory or other work may be altered, and a Student may be drafted from one class to an equivalent one. Any such changes must be sanctioned by the Head Teacher.

PREPARATORY COURSES.

Those who pass the Entrance Examination in the SECOND CLASS, or who have spent one year in the Sixth Standard of a National or Secondary School, may enter one of the "Introductory" Courses. Those who pass in the Third Class, or have not passed the Sixth Standard, are only at liberty to join one of the "Preliminary" Courses.

The Introductory Course Classes are of such a nature as to fit students to take up a Specialised Course of Technical Instruction in the following School Session. The subjects of instruction are:

- (a) English.
- (b) Elementary Mathematics and Arithmetic.
- (c) Drawing or Elementary Science or Elementary Domestic Economy.

The Preliminary Courses are similar to the Introductory, but of a more elementary character.

Any Trade Student who is taking an Introductory Course may attend the First Year Practical Class in his particular trade.

A class in Irish may be added to the Introductory or Preliminary Courses if desired, without extra fee.

FEES.

The fee for a full course or for a single class in Technological or Science subjects is usually 7s. 6d., Commercial or Domestic Economy subjects 10s. Special fees are: Wireless Telegraphy, £3 for Day Course; £2 for Evening Course; Day Commercial Course, £2; Motor Car Driving, £2; Practical Chemistry, 15s.; Practical Pharmacy, 15s.; Pharmaceutical Chemistry, £1 10s.; Materia Medica, 7s. 6d.; Botany, 7s. 6d.; Day Classes in Domestic Science, £1.

Holders of the Higher Grade Certificate will be admitted free on production of the Certificate.

If a student wishes to take up a class in addition to those of the Course, an extra fee must be paid except in the case of Irish.

All fees are payable in advance and cover the full Session or Term. Fees are not returnable.

GENERAL NOTICES.

The general enrolment of Students commences on Monday, 17th September, 1928.

Applicants for admission to Courses or Classes must be at least fourteen years of age.

Pupils actually in attendance at a Day National School or Day Secondary School are not eligible for admission to Evening Courses or Classes.

Teachers may be consulted on their class nights as shown in the Time Tables.

If any Student is absent from three consecutive meetings of any Class, unless for valid cause shown before the third meeting, his Ticket for the Class, or for the whole Course of which it is part, is liable to be cancelled without further warning.

The Trade classes are intended for those engaged in the several trades. Others will not be admitted before November 7th, and then only if there be room, and on payment of a quadruple fee.

A laboratory or workshop class can only be taken in conjunction with an approved lecture or drawing class. No Student will be allowed to remain in a laboratory or workshop class if his attendance at the lecture or drawing class proves unsatisfactory.

A class may be discontinued in the event of an insufficient number of Students joining or attending; and the number of evenings allotted weekly to any class may be reduced if there be a falling off in the attendance of Students. The right is reserved to close classes for any other reason whatever.

Students are to make good any damage done by them.

Strict order must be observed at all times within the precincts of the Schools.

Day Apprentice School.

The Scheme for a Day Apprentice School was adopted by the Conference on the Industrial Training of Apprentices, by the Technical Education Committee, by the Department of Agriculture and Technical Instruction, and by the Corporation of Dublin.

The object of the Scheme is to link technical education closely with industry by giving a specialised training from the outset of a boy's industrial career.

Apprenticeship Scholarships—approximately one hundred—may be awarded annually, on the results of examinations, to boys between the ages of fourteen and sixteen years. The Scholarships entitle the holders to a free training for two years in the Apprentice School, together with a payment of six shillings weekly for the first year, and eight shillings weekly for the second year; books and instruments will be supplied.

The Scholarships and Free Places are *strictly confined* to boys whose parents or guardians are resident in rate-paying houses within the boundaries either of the City of Dublin or the Urban Districts of Rathmines and Rathgar.

The course of instruction is altogether in the daytime; it covers 30 hours weekly for 46 weeks in each year; approximately one-third of the time in first year and two-thirds in the second year are devoted to a thoroughly practical and theoretical training in the trade for which the boy is preparing.

Pupils are allowed to select as far as possible the trades they desire to follow, and on the conclusion of the two years' course the Employers' and Trades Associations will allocate the boys to existing vacancies for apprentices.

An attendance of not less than eight hours weekly at the Technical School will be required during the terms of apprenticeship (*i.e.*, after the boy has left the Apprentice School).

The courses at present in operation are:—(1) *Plumbers*; (2) *Carpenters*; (3) *Printers*; (4) *Mechanical Engineering*; (5) *Electrical Engineering*; (6) *Sheet Metal Plate Work*; (7) *Cabinetmaking*; and (8) *Painting and Decorating, Brass-finishing, Motor Car Engineering, Brick-laying, Quantity Surveying*. The date and full particulars of Entrance Examinations will be duly announced in the Schools and in the Dublin Press from time to time.

Shorter Courses varying slightly from the above terms are conducted for the Catering Industry (training of Chefs, Waiters, and Waitresses).

SCHOLARSHIPS.

UNIVERSITY SCHOLARSHIPS.

The Corporation of Dublin provide Sixteen Scholarships and reserve four of these "for Students who have attended the City of Dublin Technical Schools," each of the annual value of £60, tenable for three years. Candidates must have attended the City of Dublin Technical Schools during at least one Session as a condition of eligibility for admission to the Scholarship Examination, and such candidates must have been in (*bona fide*) regular daily employment.

SPECIAL TRAINING FOR DIPLOMAS.

1. Courses of training will be instituted in the autumn session with a special view to the requirements of students preparing for admission to the recognised engineering institutions.

2. For the present the course will be confined to candidates for the Institution of Electrical Engineers and the Institution of Automobile Engineers.

3. The courses will be open to students between the ages of 17 and 25 selected on the results of an entrance examination which will be a test of general educational and of elementary technical attainments.

4. The courses may comprise both day-time and evening classes; they will be of a progressive nature covering a total period of approximately three years.

SCHOLARSHIPS.

1. The Technical Education Authority offers seven Scholarships each in Electrical Engineering and Automobile Engineering. Four of these Scholarships in each subject will be reserved for students of the Day Apprentice School; three in each subject will be open for competition to other students of the Schools or to applicants from elsewhere.

2. The award of the Scholarships will be made on the results of an examination.

3. The value of each Scholarship will be:—

1st Year	£5
2nd Year	£7
3rd Year	£10

4. The Technical Education Authority reserves the right to cancel a Scholarship in the case of faulty attendance, want of progress, indiscipline, or other unsatisfactory conduct.

Note.—For the current year the number of Scholarships in Electrical Engineering will be five, two of which will be reserved for students of the Electrical Engineering Section in the Day Apprentice School.

THE FOY SCHOLARSHIP.

A former student of the City of Dublin Municipal Technical Schools, Mr. W. P. Armstrong, has established a Scholarship in Chemistry, to be called the "Foy Scholarship." The annual value of the Scholarship is about £20, being the proceeds of an investment of £500 in Dublin Corporation Stock.

The Scholarship is awarded each session on the result of an examination in Chemistry, usually held in May. All students who have attended regularly during two sessions in the Chemistry Department are eligible to compete, and the student to whom the Scholarship is awarded must pursue his studies in the Chemistry Department during the following session.

THE DUBLIN MECHANICS' INSTITUTE SCHOLARSHIPS.

The above Scholarships are provided for by the Dublin Mechanics' Institute Residuary Fund, which has been made available for Industrial Scholarships.

Three Scholarships will be awarded annually—one in the Mechanical Engineering Group, one in the Electrical Engineering and Physics Group, and one in the Building Trades Group. The Scholarships are tenable for three years, and are value about £3 each per year.

Candidates must be engaged in an Operative Trade as Apprentices or Learners. They must be between the ages of 16 and 19, and must have attended a Technical Course during the preceding School Session and made 80 per cent. of the possible attendances in two of the subjects of the Course in which they are entered.

THE MULLIGAN SCHOLARSHIPS.

As a result of a bequest, Sixteen Scholarships of £1 each will be awarded on the results of the second year examination of the Department of Education.

DAY APPRENTICE SCHOOL SCHOLARSHIPS.

(See page 10.)

PRIZES.

SCHOOL PRIZES.

First and Second Prizes are awarded in each year of each subject on the results of the Sessional Examination to Students who have obtained not less than 70 per cent. marks and have at least 60 per cent. attendance of the actual class meetings.

SPECIAL PRIZES.

Numerous prizes are offered by Employers and Trade Unions; chiefly the Dublin Building Trade Employers' Association, the Irish Quantity Surveyors' Association, the Dublin Guild of Building Workers' Union, the United Operative Plumbers' Association, Dublin Brick and Stonelayers' Trade Union, Operative Plasterers' Society, Master Drapers' Association, Armstrong Siddeley Motors, Ltd., etc.

Programme and Time Table

OF THE

SCHOOL OF ARCHITECTURE, BUILDING

AND

FURNITURE TRADES

FOR THE

Session 1928-29.

School of Architecture Building and Furniture Trades.

STAFF.

WILLIAM DAVIDSON, F.B.I.C.C. ...	Head of Department.
ALOYSIUS HANWAY ...	Building Construction, Carpentry etc.
WILLIAM D. HORGAN, B.A. ...	Physics, etc.
HENRY C. CLIFTON, B.A. ...	Mathematics.
JAMES J. MCCORMICK, B.A. ...	English, etc.
A. M. McLoughlin, B.A. ...	Mechanics.
W. L. WHELAN ...	Art.

PART-TIME LECTURERS AND DEMONSTRATORS.

MARTIN J. BURKE, M.S.A., F.S.I., L.R.I.B.A.	Builders' Quantities.
CHAS. G. McNAMARA, B.E., A.M.I.C.E.I., A.M.I.S.E.	Building Construction.
P. CORMACK, F.C.S.C.I. ...	Land Surveying and Levelling.
JOHN O'CALLAGHAN ...	Carpentry and Joinery.
JAMES F. CLEARY ...	Carpentry and Joinery Geom. Building, Drawing, etc.
JAMES HICKS ...	Cabinet-making.
HENRY HICKS ...	Cabinet-making (Asst.)
JOSEPH F. MATHEWS ...	Cabinet-making
F. O'NEILL ...	French Polishing.
THOMAS ROCHE ...	Upholstery.
JAMES J. BURKE ...	Drawing for Cabinet-making.
JAMES SAUNDERS ...	Plasterers' Work.
JOHN CRAWFORD ...	Plasterers' Work (Asst.)
THOMAS KELLY ...	Coach and Motor Body Building. and Railway Carriage Building.
RICHARD McNAMARA ...	Coach Painting.
GEORGE O'KEEFFE ...	Coach Trimming.
JOHN BOLTON ...	Plumbing.
THOMAS RYAN ...	Acetylene Welding, etc.
EDWARD BYRNE ...	Brickwork.
CHARLES O'BYRNE ...	Painting and Decorating.
M. SOMERS ...	Wood Cutting Machinery.
JOHN MILLIGAN ...	Woodcarving.
JAMES McNAMEE ...	English and Mathematics.
DAVID S. MACEOIN ...	Irish.
...	Mechanics and Geometry.
THOS. SLEVIN ...	Building Construction and Quantities.
JOSEPH CLARKE ...	Manual Instruction.

EXPLANATORY STATEMENT.

The programme of this Department includes Architecture, Building in all its branches, Furnishing and Coach-building Trades.

EQUIPMENT.

The Architecture and Building Trades Department occupies a number of rooms on each of the floors A, B, C and D of the Bolton Street Technical Institute. The drawing offices and workshops are very fully equipped for conducting the instruction in a thoroughly practical manner.

COURSES.

A complete course of study in any section generally occupies about three years.

Where possible, separate classes for journeymen will be arranged in trades subjects.

SPECIAL WORK.

Arrangements will, as far as possible, be made to enable highly qualified students to carry on drawing or practical work of a special nature. Students who desire to take advantage of this privilege should make application to the Head of the Department.

COURSES AND TIME TABLES.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER
---------------------	---------	-----	------	------	---------

DAY APPRENTICE SCHOOL. COURSES IN :—

BRICKWORK	...	} 30 hours weekly. See separate Time Table.
PLUMBING	...	
CARPENTRY	...	
PAINTING	...	
CABINET-MAKING	...	
QUANTITY SURVEYING	...	

Other Day Courses under consideration.

Special Day Classes for Apprentice Painters—Mon., Tues., Wed., Thurs., 2 to 5 p.m.

INTRODUCTORY COURSE—Fee, 7s. 6d. for Session.

100B	English—C	...	Fri.	7.30–8.30	C1	J. McNamee.
	Workshop Arithmetic—C	...	Fri.	8.30–9.30	C1	J. McNamee.
	Building Drawing—A	...	Thur.	7.30–9.30	B10	J. F. Cleary.

GENERAL BUILDING CONSTRUCTION COURSE.

For Architects, Builders, Clerks of Works, and others—Fee, 7s. 6d. for each Year of Course.

101 ^B	FIRST YEAR.					
	Building Construction—I...	Wed.	7.30–9.30	B10	J. F. Cleary.	
	Practical Mathematics—I.A.	Thurs.	7.30–9.30	C4	H. C. Clifton.	
	Practical Geometry—I.B ...	Tues.	7.30–9.30	B10	J. F. Cleary.	
102 ^B	SECOND YEAR.				W. Davidson and	
	Building Construction—II.	Wed.	7.30–9.30	B2	[C. G. McNamara.	
	Geometry and				—	
	Mechanics—II. ...	Thurs.	7.30–9.30	B9		
103 ^B	THIRD YEAR.				W. Davidson and	
	Building Construction—III.	Thurs.	7.30–9.30	B2	[C. G. MaNamara.	
	Applied Mechanics—III. ...	Wed.	7.30–9.30	B9	M. Burns.	
104 ^B	FOURTH YEAR.				W. Davidson and	
	Building Construction—IV.	Thurs.	7.30–9.30	B2	[C. G. McNamara.	
	Applied Mechanics—IV. ...	Wed.	7.30–9.30	B9	—	

ARCHITECTURE COURSE—Fee, 7s. 6d. for each Year of Course.

105 ^B	FIRST YEAR.				
	Building Construction—I.	Wed.	7.30–9.30	B10	—
	Practical Mathematics—I.A.	Thurs.	7.30–9.30	C4	—
	Practical Geometry—I.B. ...	Tues.	7.30–9.30	B10	—
	History of Architecture ...	Fri.	7.30–9.30	B9	—
106 ^B	SECOND YEAR.				
	Building Construction—II.	Wed.	7.30–9.30	B2	—
	Geometry and				
	Mechanics—II. ...	Thurs.	7.30–9.30	B2	—
	History of Architecture—II.	Fri.	7.30–9.30	B9	—
107 ^B	THIRD YEAR.				
	Building Construction—III.	Thurs.	7.30–9.30	B10	—
	Perspective and Drawing				
	from Antique. History of				
	Architecture ...	Fri.	7.30–9.30	B9	—

The Fourth and Fifth Year Subjects will be included in the Time Table later. For Special Building Classes, see Builders' Quantities, Geometrical Handrailing, Land Surveying and Levelling (p. 22).

BUILDING TRADES' COURSES.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER
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CARPENTERS' AND JOINERS' COURSE—Fee, 7s. 6d. for each Year of Course.

110B	FIRST YEAR.					
	Carpentry and Joinery,					
	Practice—I.	...	Tues.	7.30–9.30	C8	J. O'Callaghan.
	Practical Geometry and					
	Calculations—I.B	...	Fri.	7.30–9.30	B10	J. F. Cleary.
111B	Carpentry and Joinery,					
	Practice—I.	...	Wed.	7.30–9.30	C8	J. O'Callaghan.
	Practical Geometry and					
	Calculations—I.B	...	Fri.	7.30–9.30	B10	J. F. Cleary.
112B	SECOND YEAR.					
	Carpentry and Joinery,					
	Practice—II.	...	Mon.	7.30–9.30	C8	J. O'Callaghan.
	Carpentry and Joinery,					
	Lecture and Drawing—II.	...	Thurs.	7.30–9.30	C8	J. O'Callaghan.
113B	THIRD YEAR.					
	Carpentry and Joinery—					
	Practice—III.	...	Mon.	7.30–9.30	C8	J. O'Callaghan.
	Carpentry and Joinery,					
	Lecture and Drawing—III.	...	Thurs.	7.30–9.30	C8	J. O'Callaghan.

PLUMBERS' COURSE—Fee, 7s. 6d. for each Year of Course.

116B	FIRST YEAR.					
	Plumbers' Work, Lecture					
	and Drawing—I.	...	Tues.	7.30–9.30	D10	J. T. Bolton.
	Plumbers' Work, Pract.—I.	...	Mon.	7.30–9.30	D10	J. T. Bolton.
	Chemistry and Physics for					
	Plumbers—I.	...	Thurs.	7.30–9.30	A6 and 8	W. D. Horgan.
117B	SECOND YEAR.					
	Plumbers' Work, Lecture					
	and Drawing—II.	...	Fri.	7.30–9.30	D10	J. T. Bolton.
	Plumbers' Work, Pract.—II.	...	Thurs.	7.30–9.30	D10	J. T. Bolton.
118B	THIRD YEAR.					
	Plumbers' Work, Lecture					
	and Drawing—III.	...	Fri.	7.30–9.30	D10	J. T. Bolton.
	Plumbers' Work, Pract.—III.	...	Thurs.	7.30–9.30	D10	J. T. Bolton.

(See Oxy-acetylene Welding and Cutting Class).

PLASTERERS' COURSE—Fee, 7s. 6d. for each Year of Course.

120B	FIRST YEAR.					
	Plasterers' Work, Drawing—I.	...	Tues.	7.30–9.30	C3	W. H. Megahey.
	Plasterers' Work, Practice	...	Mon. Th.	7.30–9.30	D3	J. Saunders.
	and Theory—I.					
121B	SECOND YEAR.					
	Plasterers' Work, Practice		Fri.	7.30–9.30	D3	J. Saunders.
	and Theory—II.					
	Do. Drawing—II.	...	Tues.	7.30–9.30	C3	W. H. Megahey.
	Modelling for Plasterers—II.	...	Wed.	7.30–9.30	D3	J. Saunders.
122B	THIRD YEAR.					
	Plasterers' Work, Practice		Fri.	7.30–9.30	D3	J. Saunders.
	and Theory—III.					
	Do. Drawing—III.	...	Tues.	7.30–9.30	C3	W. H. Megahey.
	Modelling for Plasterers—III.	...	Wed.	7.30–9.30	D3	J. Saunders.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER
PAINTERS' AND DECORATORS' COURSE—Fee, 7s. 6d. for each Year of Course.					
FIRST YEAR.					
125 ^B	Painters' Work, Pract.—I. ...	Tues.	7.30-9.30	C10	C. O'Byrne.
	Drawing and Theory—I. ...	Mon.	7.30-9.30	C11	C. O'Byrne.
SECOND YEAR.					
126 ^B	Painters' and Decorators Work (Seniors and Journeymen)—II.	Fri.	7.30-9.30	C11	C. O'Byrne.
THIRD YEAR.					
127 ^B	Painters' and Decorators' Work (Seniors and Journeymen)—III.	Fri.	7.30-9.30	C11	C. O'Byrne.
CABINET-MAKERS' COURSE—Fee, 7s. 6d. for each Year of Course.					
FIRST YEAR.					
129 ^B	Cabinet-making, Lecture and Drawing—I. ...	Wed.	7.30-9.30	B6	J. Hicks, J. J. Burke
	Cabinet-making, Pract.—I. ...	Thurs.	7.30-9.30	B6	J. Hicks.
SECOND YEAR.					
130 ^B	Cabinet-making, Lecture and Drawing—II. ...	Wed.	7.30-9.30	B6	J. Hicks, J. J. Burke.
	Cabinet-making, Pract.—II. ...	Mon.	7.30-9.30	B6	J. Hicks.
THIRD YEAR.					
131 ^B	Cabinet-making, Lecture and Drawing—III. ...	Wed.	7.30-9.30	B6	J. Hicks, J. J. Burke.
	Cabinet-making, Pract.—III. ...	Mon.	7.30-9.30	B6	J. Hicks.
FOURTH YEAR.					
132 ^B	Cabinet-making, Lecture and Drawing ...	Wed.	7.30-9.30	B6	J. Hicks, J. J. Burke
	Cabinet-making, Practical ...	Tues.	7.30-9.30	B6	J. Hicks.
COURSE IN UPHOLSTERY, Fee, 7s. 6d.					
FIRST YEAR.					
135 ^B	Upholstery, Theory and Practice ...	Mon., Wed.	7.30-9.30	B3	T. Roche.
SECOND YEAR.					
136 ^B	Upholstery, Theory and Practice ...	Mon., Wed.	7.30-9.30	B3	T. Roche.
THIRD YEAR.					
137 ^B	Upholstery, Theory and Practice ...	Mon., Wed.	7.30-9.30	B3	T. Roche.
WOOD-CARVING—Fee, 7s. 6d. for each Year of Course.					
FIRST YEAR.					
140 ^B	Wood-carving, Lecture and Drawing—I. ...	Mon.	7.30-9.30	B7	J. Milligan.
	Wood-carving, Practical—I. ...	Tues.	7.30-9.30	B7	J. Milligan.
	Mechanical Drawing and Design—I. ...	Wed.	7.30-9.30	B6	J. J. Burke.
SECOND YEAR.					
141 ^B	Wood-carving, Lecture and Drawing—II. ...	Mon.	7.30-9.30	B7	J. Milligan.
	Wood-carving, Practical—II. ...	Tues.	7.30-9.30	B7	J. Milligan.
	Design—II. ...	Wed.	7.30-9.30	B6	J. J. Burke.
THIRD YEAR.					
142 ^B	Wood-carving, Lecture and Design—III. ...	Mon.	7.30-9.30	B7	J. Milligan.
	Wood-carving, Pract.—III. ...	Tues.	7.30-9.30	B7	J. Milligan.
	Design—III. ...	Wed.	7.30-9.30	B6	J. J. Burke.
FRENCH POLISHING COURSE—Fee, 7s. 6d. for each Year of Course.					
FIRST YEAR.					
145 ^B	French Polishing, Theory and Practice ...	Fri.	7.30-9.30	B3	F. O'Neill.
SECOND YEAR.					
146 ^B	French Polishing, Theory and Practice ...	Fri.	7.30-9.30	B3	F. O'Neill.

No. of Course	SUBJECT	Day	Hour	Room	TEACHER
COACH AND MOTOR BODY BUILDERS' COURSES—Fee for each Course, 7s. 6d.					
FIRST YEAR. C.					
148 ^B	Coach and Motor Body Building—I. (Lect. and Drawing) ...	Wed.	7.30-9.30	B5	T. Kelly.
	Do. (Practical) ...	Thur.	7.30-9.30	B5	T. Kelly.
SECOND YEAR. C.					
149 ^B	Coach and Motor Body Building—II. (Lect. and Drawing) ...	Wed.	7.30-9.30	B5	T. Kelly.
	Do. (Practical) ...	Thur.	7.30-9.30	B5	T. Kelly.
FIRST YEAR—T.					
152 ^B	Coach and Motor Body Building—I. (Lect. and Drawing) ...	Fri.	7.30-9.30	B5	T. Kelly.
	Do. (Practical) ...	Tues.	7.30-9.30	B5	T. Kelly.
SECOND YEAR—T.					
153 ^B	Coach and Motor Body Building, II. (Lect. and Drawing) ...	Fri.	7.30-9.30	B5	T. Kelly.
	Do. (Practical) ...	Tues.	7.30-9.30	B5	T. Kelly.
RAILWAY CARRIAGE BUILDING.					
FIRST YEAR.					
156 ^B	Railway Carriage Building, I. (Lecture and Drawing) ...	Tues.	7.30-9.30	B9	—
	Railway Carriage Building, I. (Practical) ...	Mon.	7.30-9.30	B5	—
SECOND YEAR.					
157 ^B	Railway Carriage Building, II. (Lecture and Drawing) ...	Tues.	7.30-9.30	B9	—
	Railway Carriage Building, II. (Practical) ...	Mon.	7.30-9.30	B5	—
COACH PAINTING.					
FIRST YEAR.					
160 ^B	Coach Painting—I. (Pract.) ...	Thurs.	7.30-9.30	C10	R. McNamara.
	Do. (Drwg. and Lettering) ...	Wed.	7.30-9.30	C11	R. McNamara.
SECOND YEAR.					
161 ^B	Coach Painting—II. (Pract.) ...	Thurs.	7.30-9.30	C10	R. McNamara.
	Do. (Drwg. and Lettering) ...	Wed.	7.30-9.30	C11	R. McNamara.
COACH TRIMMING.					
FIRST YEAR.					
164 ^B	Coach Trimming ...	Mon., Wed.	7.30-9.30	A14	G. O'Keeffe.
SECOND YEAR.					
165 ^B	Coach Trimming ...	Mon., Wed.	7.30-9.30	A14	G. O'Keeffe.
WOODCUTTING MACHINISTS' COURSE—Fee, 7s. 6d. for each year of Course.					
FIRST YEAR.					
170 ^B	Woodcutting Machinery—I. (Drawing) ...	Mon.	7.30-9.30	B9	M. Somers.
	Woodcutting Machinery—I. (Practical) ...	Tues.	7.30-9.30	C9	M. Somers.
SECOND YEAR.					
171 ^B	Woodcutting Machinery—II. (Drawing) ...	Fri.	7.30-9.30	B9	M. Somers.
	Woodcutting Machinery—II. (Practical) ...	Wed.	7.30-9.30	C9	M. Somers.
BRICK AND STONELAYERS' COURSE—Fee, 7s. 6d. for Session.					
FIRST YEAR.					
174 ^B	Bricklaying (Practical) ...	Tues.	7.30-9.30	A13	E. Byrne.
	Bricklaying (Drawing and Theory) ...	Fri.	7.30-9.30	B2	E. Byrne.
SECOND YEAR.					
175 ^B	Bricklaying (Practical) ...	Thur.	7.30-9.30	A13	E. Byrne.
	Bricklaying (Drawing and Theory) ...	Mon.	7.30-9.30	B2	E. Byrne.
COURSE, STONECUTTING, Fee 7s. 6d.					
FIRST YEAR.					
178 ^B	Stonecutting, Lecture and Drawing ...	Wed.	7.30-9.30	B11	—

No. of Course	SUBJECT	Day	Hour	Room	TEACHER.
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MISCELLANEOUS CLASSES—Fee, 7s. 6d. per Class for the Session.

*CLASS A	Land Surveying and Levelling. (See note below.)	FEE, 15s.			
"	B Builders' Quantities—I., II.	Mon.	7.30-10.0	B11	M. J. Burke.
"	C Geometrical Handralling, I.	Tues.	7.30-9.30	B2	W. Davidson.
"	E Manual Instruction (Wood)	Mon.	7.30-9.30	B4	J. C. Clarke.
"	E Mech. Drawing and Design	Fri.	7.30-9.30	C3	J. J. Burke.
"	F Manual Instruction (Wood)	Thurs.	7.30-9.30	B4	J. C. Clarke.
"	F Mech. Drawing and Design	Mon.	7.30-9.30	C3	J. J. Burke.
"	G Manual Instruction (Wood)	Wed.	7.30-9.30	B4	J. C. Clarke.
"	H Manual Instruction (Wood)	Fri.	7.30-9.30	C8	J. O'Callaghan.
"	J Manual Instruction (Wood)	Fri.	7.30-9.30	B4	—
"	J Mech. Drawing and Design	Thurs.	7.30-9.30	C3	—
†	K Oxy-Acetylene Welding and Cutting	Tues.	7.30-9.30	D10	T. Ryan.
"	L Plan Drawing and Reading	Mon.	7.30-9.30	B10	J. F. Cleary.

SPECIAL CLASSES IN IRISH.

Irish—I.A.	...	Mon.	7.30-9.30	—	D. S. MacEoin.
Irish—I.B.	...	Thurs.	7.30-9.30	—	D. S. MacEoin.

PRELIMINARY COURSE.—Fee, 7s. 6d. for Session.

English	...	Tues.	8.30-9.30	—	J. McNamee.
Arithmetic	...	Tues.	7.30-8.30	—	J. McNamee.
Drawing	...	Wed.	7.30-9.30	C3	J. McNamee.

*This Class may start in February, 1929, if a sufficient number of applications be received.

†Free to Students of Plumbing Classes II. and III. years. The class will commence in January, 1929.

ARCHITECTURE AND BUILDING TRADES.

COURSES AND SYLLABUSES.

DAY SCHOOL OF BUILDING.

DAY APPRENTICE SCHOOL.

Scholarship Courses for Carpenters, Plumbers, Painters, Cabinet-makers, and others, 30 hours' instruction weekly. (See separate Time-table and other Syllabuses.)

COURSE FOR PAINTERS' APPRENTICES, six hours weekly:—Mondays, Tuesdays, Wednesdays, Thursdays, 2 to 5 p.m. (Syllabus as set out for Evening Classes in Painters' and Decorators' Work.)

N.B.—Other Day Courses are now under consideration.

INTRODUCTORY BUILDING COURSE.

Subjects:

1. ENGLISH.
2. WORKSHOP ARITHMETIC.
3. BUILDING DRAWING.

ENGLISH.

Reading: Reading from a text book on building subjects—correct meanings of words—correct spelling. *Letter Writing:* The essentials of good letter writing—forms of address in business letters—the beginning and ending of a letter. *Writing Reports and Descriptions:* Preparing the outline of a report on building work—matters with which the report should deal; progress, causes of delay, difficulties of obtaining materials, delay in transit of materials, trouble in obtaining suitable local labour, and other likely matters—how to describe simply and tersely any building process points in such a description—outstanding features—more particular descriptions of selected portions.

WORKSHOP ARITHMETIC.

Arithmetic signs: Units—units of area—simple fractions—decimals—area of triangle, rectangle, irregular quadrilaterals, walls of room, sides of tank, etc.—the circle, circumference, area, etc.—volumes and weight of rectangular solids, cylinders, etc.—capacity of tanks, cylindrical pipes—surface area of cone, pyramid and cylinder—proportions by unitary method—percentages—square root—calculating costs from areas and volumes.

BUILDING DRAWING.

Drawing instruments—general setting out and arrangement—plain scales—scale drawing—the protractor—decimal scale—drawing quadrilateral figures, cutting out in paper and finding area—square root and its graphical representation—relation diameter of circle to circumference—area of circle—comparison of areas of similar figures—elliptic and segmental curves—drawing in three dimensions—plans, elevations, and sections—simple development of surfaces—isometrical representation of solids.

FIRST YEAR COURSE IN GENERAL BUILDING CONSTRUCTION.

Subjects:

1. BUILDING CONSTRUCTION.
2. PRACTICAL MATHEMATICS.
3. PRACTICAL GEOMETRY.

BUILDING CONSTRUCTION.

In this class the student will be familiarised with the more common building materials. Practice in freehand pictorial sketching of building details will be given, and students will be required to make therefrom proper working details to scale.

During the session occasional visits will be paid to buildings in course of erection for the purpose of examining and sketching details of construction.

FIRST YEAR.

Foundations: foundations and footings in ordinary soils—damp-proof courses. *Brickwork*: simple bonds of brickwork in plain walling—sleeper walls—segmental and semi-circular gauged arches—various kinds of bricks, and the purposes for which each is fitted. *Masonry*: varieties of rubble and ashlar walling—plain work on sills—wall copings—characteristics of sandstones and limestones. *Carpentry and Joinery*: single floors—trimming around well-holes and fireplaces—stud partitions—ordinary roofs, including king-posts trusses—construction of ledged and braced and panelled doors—door frames and plain jamb linings—fixing of skirtings and architraves—construction of casement frames and double-hung sashes—casement frames and sashes. *Slating*: terms used in slater's work—cutting and fixing of slates—treatment at eaves and ridges. *Plumbing*: lead gutters and flashings. *Plastering*: composition of various coats of plaster—ordinary lathing and plastering of internal walls, ceilings, and partitions.

TEXT BOOK.—C. F. Mitchell: Elementary Building Construction and Drawing.

FIRST YEAR.

PRACTICAL MATHEMATICS.

Approximate calculations—fractions—areas of triangle, rectangle, parallelogram, trapezium, irregular quadrilateral, etc.—evaluation of formulæ—algebraic symbols—rules as algebraic formulæ—mensuration of the circle, prism, cone, cylinder, pyramid—easy simple equations—transposing formulæ—square root—the right-angled triangle, sine, cosine, and tangent of an angle and use of tables—percentages—averages—graphs—areas of irregular curved figures and average values by mid-ordinate rule.

FIRST YEAR.

PRACTICAL GEOMETRY.

Construction and use of scales—plotting of angles by protractor, or trigonometric tables—division of lines in giving proportions—measurement of angles in degrees—sine, cosine, and tangent of an angle—their values by graphical methods—construction of a triangle from given data—location of points by rectangular co-ordinates—construction of polygons—similar figures—enlarging and reducing figures by radial projection—areas of triangles, polygons, and curved figures—construction of circles from specified data—tangents—angles in a segment—methods of defining positions in space, of points, lines, and planes—horizontal and vertical traces—inclinations of lines and planes to planes of projection—prisms and pyramids—the regular tetrahedron—the sphere—the right circular cylinder and cone—plans, elevations, and sections of these solids.



DAY APPRENTICE SCHOOL—CARPENTRY AND JOINERY WORKSHOP.

SECOND YEAR COURSE IN GENERAL BUILDING CONSTRUCTION.

Subjects:

1. BUILDING CONSTRUCTION.
2. GEOMETRY AND MECHANICS.

BUILDING CONSTRUCTION.

The instruction in the second year will give a more extended knowledge of the subjects dealt with in the first year syllabus, including the following:—

SECOND YEAR.

Foundations: precautions in excavations in various soils, with necessary strutting and timbering—concrete foundations for walls and piers—damp-proofing of basements and ventilating of underground floors. *Brickwork:* bonding in junction of walls at right angles, in fireplaces and flues—finishing of chimney stacks—hollow walls and methods of bonding them—construction of flat elliptical and pointed arches—corbelling. *Masonry:* stone dressings—joints and fastenings in stone-work—string courses and cornices—corbelling, arches—well-known building stones, quarrying, cutting, etc. *Carpentry and Joinery:* double floors—centres for segmental and circular arches to 15 ft. span—“Flitch” beams—queen-post and composite roof up to 40 ft. span—preparing flat roof for plumbing—box and taper gutter—trimming around skylights, chimneys, etc.—self-supporting wood partitions—doors in hard and soft woods—methods of finishing panels, framed and panelled jamb linings—vestibule doors and frames—French casement windows—pivot-hung windows—skylights—dog-leg and open newel stairs with trimmings. *Slating:* roof coverings, methods of fixing. *Plumbing:* leadwork on roofs, gutters and flats, with rolls, drips, etc.—joints used in plumbing. *Sanitary Work:* principles of sanitation, laying and jointing of glazed stoneware and iron pipes—connection with main sewer—ventilation of drains—varieties of traps and gullies—testing of drains by smoke and by water. *Plastering:* plasterers’ work of all kinds, with knowledge of composition of materials used. *Painting and Glazing:* properties and qualities of pigments, varnishing, oils, and other materials used in house painting and window glazing.

TEXT BOOK.—Mitchell: Advanced Building Construction.

GEOMETRY AND MECHANICS.

SECOND YEAR.

Areas of irregular plane figures by squared paper—mid-ordinate rule and Simpson’s rule—mensuration of geometrical solids—volumes and weights of girders, floors, roof coverings—amount of excavation in trenches for walls—volume of concrete in foundations, etc.—more difficult examples in plane geometry—construction and chief characteristics of the ellipse—further examples of plans, elevations, and sections of solids—development and interpenetration—general problems on lines and planes—intersecting planes and the angle between them, with practical applications—parallel and perpendicular lines and planes—dihedral angle.

Graphical statics—the triangle and polygon of forces—stresses in frames—parallel forces—reactions of supports—unit of force—measurement of force—composition and resolution of forces—moments of couples—centre of gravity and stability—efficiency of machines, lifting tackle—friction—stress, strain and elasticity.

THIRD YEAR COURSE IN GENERAL BUILDING CONSTRUCTION.

Subjects:

1. BUILDING CONSTRUCTION.
2. APPLIED MECHANICS.

BUILDING CONSTRUCTION.

In this year of the Course the student will obtain a wider knowledge of the subjects already dealt with. More time will be given to the making of finished drawings. Colouring, tracing and inking-in will receive some attention.

THIRD YEAR.

Drawing: inking-in, tracing, colouring and lettering of drawings. *Foundations:* natural and artificial foundations upon land and under water—timbering for excavations—damp sites and their treatment. *Brickwork:* bonds of all kinds—composite walls—retaining walls—ornamental construction in brickwork—sewer construction—brick manufacture—terra-cotta and artificial stones—their manufacture and uses. *Masonry:* various kinds of stones—their characteristics and chemical composition and suitability for different climatic conditions—construction of tracery windows—arches—stone stairs. *Carpentry and Joinery:* shoring and underpinning—scaffolding and staging—gantries and derrick towers—temporary building and half-timber work—centres for arches, and methods employed to fix and ease them—open timber and other forms of roof trusses—dormers—turrets—window frames and sashes of all kinds—shutters—lantern lights—shop fronts—planning and construction of stairs—timber: characteristics, defects, conversions, modes of seasoning, causes of decay, and means of preservation. *Plumbing and Sanitary Work:* domestic hot and cold water supply—baths, lavatories, sinks, and w.c. fittings—waste pipes, soil pipes, and ventilating pipes—sewage disposal for an isolated house—manufacture of lead and its general uses. *Ironwork and Fireproof Construction:* modern roof trusses up to forty-five feet span—steel joists and stanchions—fireproof construction in floors, roofs and stairs.

TEXT BOOK.—Mitchell: Advanced Building Construction.

APPLIED MECHANICS.

THIRD YEAR.

Revision of the Second Year’s work on moments, couples and centres of gravity—graphic statics—Bow’s notation—space and force diagrams—link polygons for parallel and non-parallel forces—further consideration of stresses in frame structures, such as roof trusses up to 45 ft. span—dead load and wind pressure diagrams—diagrams for structures not in one plane, such as are required for the stresses in shear legs, derrick cranes, etc.—stress and strain—elastic limits—elastic constants—working stresses—factors of safety—the testing of materials by compression, tension, and bending—concentrated and distributed loads on beams and cantilevers—shearing force and bending moment diagrams—the use of vector and link polygons in determining shearing forces and bending moments—theory of simple bending—distribution of stress intensity—moment of resistance—application of formulæ for moments of inertia—section modulus—strength of beams of standard sections—combined bending and direct stress—common examples of eccentric loading—pillars and application of well-known formulæ—various forms of stanchions and built-up struts—the use of manufacturers’ pocket-books in the choice of sections for beams and struts, stanchion bases and caps, connections for roof trusses, etc.

FOURTH YEAR COURSE IN GENERAL BUILDING CONSTRUCTION.

Subjects:

1. BUILDING CONSTRUCTION.
2. APPLIED MECHANICS.

BUILDING CONSTRUCTION.

FOURTH YEAR.

House planning—production of complete drawings of a small building with simple specifications and such working drawings as are usually supplied to a builder—heating systems—ventilation—methods of house sewage disposal in town and country—gas and electric lighting in their relation to building work—fireproof floors—steelwork generally—the manufacture, characteristics, and general uses of all classes of building materials, and the tests applied to ascertain their behaviour under various conditions.

APPLIED MECHANICS.

FOURTH YEAR.

Various types of roof trusses and spans for which they are suitable—determination of stresses by the method of sections—design of roof truss members—outline of design of plate or braced girder of uniform depth—calculations for deflection of a beam under specified conditions of loading—permissible deflection—camber—columns under eccentric and central loads—design of long struts in braced structures—simple calculations relating to masonry dams, retaining walls, piers and buttresses, foundations, small span arches, chimney—safe pressure on foundations in different classes of earth—distribution of pressure—resultant pressure in retaining walls—the importance of wind pressure in lofty structures—fluid pressure—changes of velocity and pressure along the stream lines in fluids—friction in pipes—simple hydraulic machines.

HONOURS COURSE IN GENERAL BUILDING CONSTRUCTION.

Subjects:

1. BUILDING CONSTRUCTION.

FIFTH YEAR.

Ferro-concrete beams and floors, roofs, columns, chimneys, retaining walls, tanks, conduits, bridges, piles, etc., and calculations thereon—various well-known systems of ferro-concrete construction and their relative advantages—practical details concerning ferro-concrete work—materials and specifications.

FIRST YEAR COURSE IN ARCHITECTURE.

Subjects:

1. BUILDING CONSTRUCTION.
2. PRACTICAL MATHEMATICS AND PRACTICAL GEOMETRY.
3. HISTORY OF ARCHITECTURE.

BUILDING CONSTRUCTION AND PRACTICAL MATHEMATICS AND PRACTICAL GEOMETRY.

(Syllabuses as for First Year General Building Construction Course.)

HISTORY OF ARCHITECTURE.

FIRST YEAR.

Egyptian, Greek and Roman Architecture—free sketching and drawing of typical mouldings and examples of construction.

This work may be supplemented by modelling and casting by the preparation of templets and the running of mouldings in plaster.

SECOND YEAR COURSE IN ARCHITECTURE.

Subjects:

1. BUILDING CONSTRUCTION.
2. GEOMETRY AND MECHANICS.
3. HISTORY OF ARCHITECTURE, PLANNING AND DESIGN.

BUILDING CONSTRUCTION AND GEOMETRY AND MECHANICS.

(Syllabuses as for Second Year Course in General Building Construction.)

HISTORY OF ARCHITECTURE, PLANNING AND DESIGN.

SECOND YEAR.

Romanesque and Byzantine Architecture—characteristic mouldings and examples of construction.

This work may be supplemented by modelling, drawing from the antique, etc. Attention will be given to the planning and design of simple structures.

THIRD YEAR COURSE IN ARCHITECTURE.

Subjects:

1. BUILDING CONSTRUCTION.
2. PERSPECTIVE AND DRAWING FROM THE ANTIQUE.
3. HISTORY OF ARCHITECTURE.

BUILDING CONSTRUCTION.

(Syllabus as for Third Year Course in General Building Construction.)

PERSPECTIVE AND DRAWING FROM THE ANTIQUE.

THIRD YEAR.

In perspective, architectural examples will be chosen. These will be carefully graded to suit the ability of the individual. In drawing from the antique the examples will be chosen in the same way.

HISTORY OF ARCHITECTURE.

THIRD YEAR.

Mediaeval Architecture and the Renaissance—Italian Renaissance Architecture.

NOTE.—An extension of this Course will be considered.

FIRST YEAR COURSE IN CARPENTRY AND JOINERY.

Subjects:

1. CARPENTRY AND JOINERY (PRACTICAL).
2. PRACTICAL GEOMETRY AND CALCULATIONS.

CARPENTRY AND JOINERY (PRACTICAL).

FIRST YEAR.

Examples to suit students' ability will be chosen. The necessary tools and timber will be provided by the Schools.

PRACTICAL GEOMETRY AND CALCULATIONS.

FIRST YEAR.

See *Syllabuses for Practical Geometry and Practical Mathematics of First Year Course in General Building Construction.*

SECOND YEAR COURSE IN CARPENTRY AND JOINERY.

Subjects:

1. CARPENTRY AND JOINERY (PRACTICAL).
2. CARPENTRY AND JOINERY (DRAWING AND LECTURE).

CARPENTRY AND JOINERY (PRACTICAL).

SECOND YEAR.

Examples to suit the students' ability will be chosen.

CARPENTRY AND JOINERY (DRAWING AND LECTURE).

SECOND YEAR.

Choice and preparation of scales—plans and elevations, including sections—examples of joints and fastenings—oblique and isometric projection of common joints—simple forms of centres, turning pieces, rib centres; segmental and elliptical—common floor joisting—common floor coverings—trimming around chimney breasts and well-holes—couple roof—collar brace roof—king post truss—setting out the commoner forms of mouldings—door frames and jamb linings—doors; braced and sheeted, four panelled—casement frame—sash frame and sashes—skirtings, grounds, and fixing—growth and structure of timber, conversion, seasoning, etc.—tools, mechanical principles involved.

TEXT BOOK.—Carpentry and Joinery.

THIRD YEAR COURSE IN CARPENTRY AND JOINERY.

Subjects:

1. CARPENTRY AND JOINERY (PRACTICAL).
2. CARPENTRY AND JOINERY (DRAWING AND LECTURE).

CARPENTRY AND JOINERY (PRACTICAL).

THIRD YEAR.

Examples to suit students' ability will be chosen.

CARPENTRY AND JOINERY (LECTURE AND DRAWING).

THIRD YEAR.

Panel doors of various kinds—jamb linings and solid door frames—diminished stile doors—swing doors—double-margin door and details—framed, legged, and braced doors—yard gates—cased frames and double-hung sashes—casement frames—French windows—pivot-hung sashes—hospital light—circular-headed sash frames, cased and solid—partitions, common and trussed—king post truss with details—queen post truss—mansard truss—bevels for oblique work generally—roof bevels—lengths and bevels for hip, valley, and jack rafters—roof bevels for purlins—backing for hips and valleys—strength of joists and beams—single, double, and framed floors—details of floors, trimming around hearths, etc.—dog-legged stairs, with details—open newel and geometrical stairs—details of circular louveres—nature and properties of various timbers—raking, flying, and dead shores—exercises in the use of the steel square.

TEXT BOOK.—Wilson: Carpentry and Joinery.

BOOKS OF REFERENCE.—G. Ellis: Modern Practical Carpentry, and Modern Practical Joinery.

FOURTH YEAR COURSE IN CARPENTRY AND JOINERY.

Subjects:

1. CARPENTRY AND JOINERY (PRACTICAL).
2. CARPENTRY AND JOINERY (DRAWING AND LECTURE).

CARPENTRY AND JOINERY (PRACTICAL).

FOURTH YEAR.

Examples to suit students' ability will be chosen.

CARPENTRY AND JOINERY (LECTURE AND DRAWING).

FOURTH YEAR.

Roofing of difficult plans, cuts and bevels for members—open timber roofs; hammer-beam and collar-beam—trusses of special form, groin roofs—turret roofs, circular and polygonal—niches—lantern lights—centres for large spans; elliptical, segmental, etc.—raking, horizontal and shoring for shop fronts—timber bridges—platform gantry and scaffolding—traveller—gantry—derrick tower gantry—geometrical staircase—staircase details and ornamental finishings—wreath for quarter circle stair—wreath for half-turn stair—wreath for quarter space of winders—wreath for scroll shank—solid mullioned, single and double boxed, venetian sash frames—balancing shutters—boxing shutters—various joinery fittings, cupboards, enclosures, etc.—circle-on-circle; door frames, with radiating and with parallel jambs—circle-on-circle; cased frames and sashes—shop fronts, with roller shutters and sun-blind—air-tight show cases; floor cases and wall cases—counter cases, square and round-ended—exercises in the use of the steel square—wood-working machinery, planer, spindle, circular saw and band saw.

TEXT BOOK.—Wilson: Carpentry and Joinery.

BOOKS OF REFERENCE.—Modern Practical Carpentry, and Modern Practical Joinery, by George Ellis.

FIRST YEAR COURSE IN PLUMBERS' WORK.

Subjects:

1. PLUMBERS' WORK (LECTURE AND DRAWING).
2. PLUMBERS' WORK (PRACTICAL).
3. PHYSICS AND CHEMISTRY.

PLUMBERS' WORK (LECTURE AND DRAWING).

FIRST YEAR.

Elementary Science: effect of heat on solids, liquids and gases—cause of frost burst, and methods of preventing it—effect of heat in causing motion in liquids and gases—its application to hot water circulation and the ventilation of pipes—thermometers—measurement of quantity of heat—relation of quantity of heat applied to rise of temperature in air, water, lead, zinc, and other substances used in plumbers' work—properties and composition of air and water. *Alloys, Solders, etc.:* various alloys used for valves and cocks—solders, their composition, preparation, and uses—fluxes, their action and uses—methods of soldering—blowpipe, copper bit, wiping, etc.—special advantages of lead burning. *Workshop Appliances:* the lever, pulley block screws—behaviour of lead under great pressure—pressure due to action of liquids and gases—head of water—nature of a water seal—action of the syphon—principles and construction of traps and valves. *Tools:* their forms, uses, etc.—fitting up and equipment of workshop—varieties of pipes used in plumbing. *Calculations:* duodecimals, mensuration of plane figures—areas of sloping and curved roof surfaces—pyramidal, conical and spherical roof coverings—estimating quantity and cost of materials—calculating capacities of pipes, tanks, boilers, cylinders, etc. *Geometry:* application of geometrical construction to cutting out sheet metals for covering dormers, gutters, lantern lights, etc.—development and interpenetration as applied to pipes, ventilators, roofs, vessels, etc.—projection—plans, elevation, sections, and details of pieces of work in plumbing, sheet metal work, etc.

In the subsequent years of the Course the Calculations and Geometry will be of the same practical nature, but of a more advanced type.

TEXT BOOK.—Bennett: Technical Plumbing.

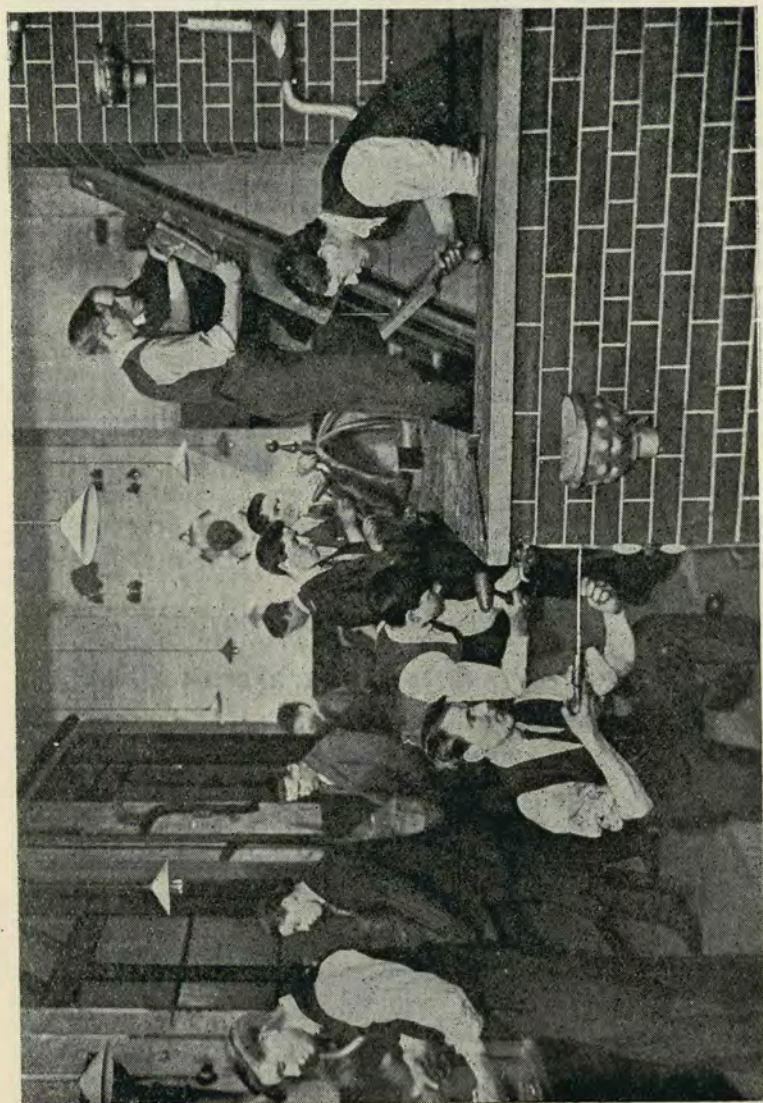
PLUMBERS' WORK (PRACTICAL).

FIRST YEAR.

See Syllabus under Third Year Course.

PHYSICS AND CHEMISTRY.

(See Syllabus under Third Year Course.)



PLUMBERS' WORKSHOP.

SECOND YEAR COURSE IN PLUMBERS' WORK.

Subjects:

1. PLUMBERS' WORK (LECTURE AND DRAWING).
2. PLUMBERS' WORK (PRACTICAL).

This Course will be found suitable for those applying for Certificate of Registration.

PLUMBERS' WORK (LECTURE AND DRAWING).

SECOND YEAR.

Properties and Uses of Materials: relative strengths, under various pressures, of lead, cast iron, wrought iron, and copper tubes—nature and uses of seamless lead pipes, tin and tin-lined pipes, sheet lead pipes, and method of joining. *External Roof Work:* covering of flats, gutters, cesspools, dormers, skylights, etc.—principles of jointing sheet lead by rolls, welts, drips, and passings—development of surfaces—making of working drawings. *Hot Water Apparatus:* principles of hot water circulation for domestic and other purposes—cylinder and tank systems—boilers and taps—material used in valve seatings, packing, etc., systems in use for prevention of furring of pipes and boilers. *Sanitary Appliances:* water closets, their fittings and supply—water-waste preventers—baths, lavatories, sinks, etc.—traps—momentum, waving out, and syphonage of traps and methods of preventing same—house cisterns, their construction and fitting—traps, pipes, fittings, and other materials used in house drain construction. *Mechanical Appliances:* the multiplication of power by water pressure, as illustrated by hydraulic press—pumps—construction and uses of different kinds of pumps—hydraulic ram, etc.

TEXT BOOK.—S. S. Hellyer: Principles and Practice of Plumbing; or W. P. Buchan: Plumbing.

BOOK OF REFERENCE.—W. R. Maguire: Domestic Sanitary Drainage and Plumbing.

PLUMBERS' WORK (PRACTICAL).

SECOND YEAR.

See Syllabus under Third Year Course.

THIRD YEAR COURSE IN PLUMBERS' WORK.

Subjects:

1. PLUMBERS' WORK (LECTURE AND DRAWING).
2. PLUMBERS' WORK (PRACTICAL).

Students will find the instruction given in this Course suitable for the Final Examination of the City and Guilds of London Institute, and for the Examination of the Royal Sanitary Institute.

PLUMBERS' WORK (LECTURE AND DRAWING).

THIRD YEAR.

Water: sources, properties, qualities; deep and shallow wells, springs—storage, filtration, and distribution—pollution: causes and prevention—quantity per head for private purposes—rain fall—flow of water in channels and pipes—calculations of velocities. *Hot Water and Heating:* method of obtaining large supplies—heating buildings by hot water and steam—high and low pressure systems—sizes of pipes and boilers—radiating surfaces for heating—heating surfaces of boilers. *Ventilation:* systems of ventilation for private dwellings and public buildings. *Drainage:* setting out town and country house drainage—sewers—storm overflow—sewage gas, and ventilation of sewers—sewage disposal for isolated country houses—testing drains and waste pipes—arrangement and fitting of sanitary appliances. *Plans and Specifications:* preparation of specifications and quantities, making of working drawings to scale—measuring work. *Bye-Laws:* Local Authorities' By-Laws and Regulations.

TEXT BOOK.—S. S. Hellyer: Principles and Practice of Plumbing.

BOOKS OF REFERENCE.—As for Second Year Course.

PLUMBERS' WORK (PRACTICAL).

FIRST, SECOND AND THIRD YEARS.

Straightening sheet lead and tin, lead pipes, etc.—preparation of seams for soldering sheet lead and tin—soldering sheet lead with fine, tinman's, and plumbing solder—preparation of solder, soil, etc.—preparation of joints for soldering with iron, blowpipe, and plumbing metal—joint making (copper bit, blowpipe, plumbing)—caulking joints with lead and rust cement—joints of earthenware and stoneware pipes—lead working into various forms—pipe fixing—pipe bending—lead burning.

An exhibition of students' practical work will be held at the close of the Session.

PHYSICS AND CHEMISTRY FOR PLUMBERS.

This subject is of the greatest importance to Plumbers, and forms part of the First Year Course.

General Properties of Matter: measurement of length, area and volume—determination of density—measurement of force—centres of gravity—the lever—the principle of work. *Fluid Pressure:* nature and modes of measurement of pressure of liquids and gases—variation

of pressure with depth in liquids—atmospheric pressure—the barometer—Boyle's Law—the principles of physics in connection with water supply, pumps and syphonic action. *Heat*: expansion of solids, liquids and gases—temperature and thermometers—heat as a quantity—the caloric and the therm—thermal capacity and specific heat—change of state—melting and boiling points—latent heats of fusion and vaporisation—change of volume resulting from change of state—the spheroidal condition and the physics of fluxes—convection, conduction and radiation. *Chemistry*: oxidation—reduction—composition of water and its action on metals—acids and salts—hydrochloric acid and “killed spirit”—elementary chemistry of lead, iron, zinc, tin and copper—composition and properties of red lead, litharge, white lead, etc., and cements made from them.

OXY-ACETYLENE WELDING AND CUTTING GLASS.

THEORETICAL INSTRUCTION.

General principle of autogenous welding—Combustion of oxygen and acetylene—Essential properties of the gases—Theoretical proportions of the gases in welding flame and the proportions actually required in practice—Freedom from oxidation of weld with correct flame—Effect of incorrect proportions—Abstraction of oxygen from atmosphere to burn the carbon monoxide and the hydrogen formed—Final products of combustion—Parts of flame with their respective chemical actions—Essential apparatus—High pressure and low pressure plants.

OXYGEN :—Physical and chemical properties bearing on the process—Methods of manufacture—Nature of impurities and their effects on welds.

ACETYLENE :—Physical and chemical properties bearing on the process—Dissolved acetylene—Generators—Purifiers—Hydraulic valve—Precautions.

CYLINDERS :—Construction—Valves—Compression pressures—Effects of temperatures—Measurement of contents—Manipulation and precautions—avoidance of lubricants—Water in oxygen cylinders—Leaky valves—Grit—Testing—Sizes obtainable—Approximate prices—Trade conditions of sale—Transport.

WELDING BLOWPIPES :—Principle—High and low-pressure types—Construction of essential parts—Interchangeable nozzles—Method of regulating gases—Ratio of oxygen to acetylene—Manipulation and care of blowpipes—Adjustment of flame.

REGULATORS :—Pipes and tubing—Appliances for holding work—Accessories—Preheating appliances—Welding machines.

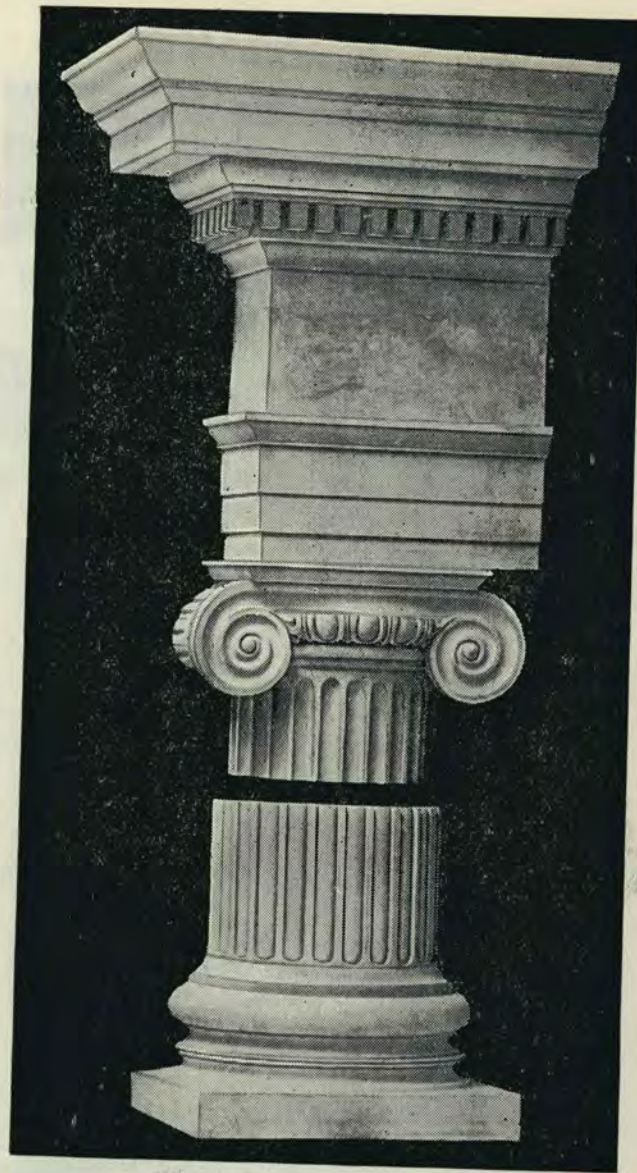
SUITABILITY OF WORK :—Application of process to various articles—Preparation of work—Preheating—Hammering and annealing.

WELDING :—General procedure—Common faults and their avoidance—Testing welds—Expansion and contraction—Welding-roids and flues—Welding of various metals—Speed and cost of work.

CUTTING :—Principle—Applicable only to iron and steel—Construction of cutting-blowpipes—Manipulation—Guides and formers for irregular work—Cutting machines—Special applications—Speeds and costs of cutting.

PRACTICAL WORK.

Examination and setting up of high-pressure welding plant and cutting plant—Testing for leaks—Regulation of pressure and manipulation of valves—Measurement of contents of cylinders—Preparation of materials—Precautions against the effects of expansion—Welding of various metals—Treatment of work after welding—Testing welds.
Cutting sheets, plates, and sectional iron.



EXAMPLE OF PLASTER WORK.

(Ionic Order.)

This specimen of Students' Work secured first place in Great Britain and Ireland, and was awarded First Prize and Silver Medal, City and Guilds of London.

COURSE IN PLASTERERS' WORK.

Subjects:

1. PLASTERERS' WORK (LECTURE AND DRAWING).
2. PLASTERERS' WORK (PRACTICAL AND THEORY).
3. MODELLING AND CASTING.

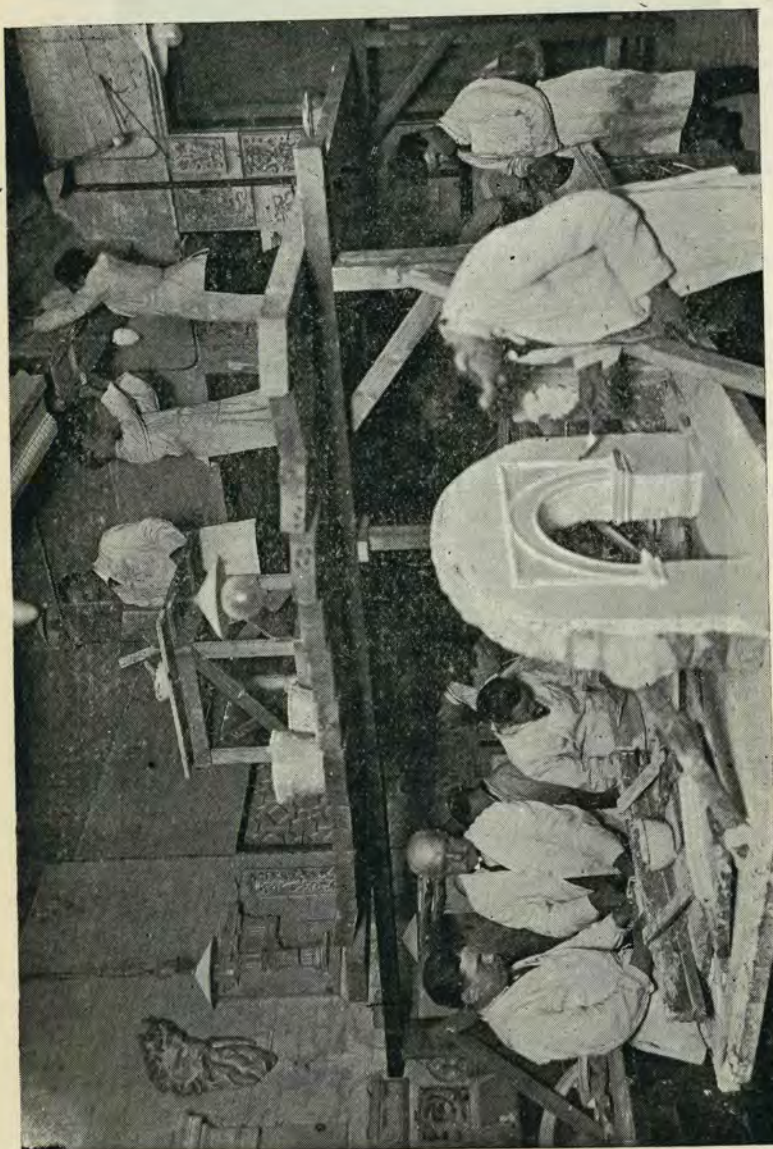
PLASTERERS' WORK.

General Syllabus of full Course.

FIRST, SECOND AND THIRD YEARS.

Arithmetic: A working knowledge of the four rules—simple and compound proportion, percentages, averages—measurements of simple rectilinear figures and circles—areas of figures expressed by means of symbols—surface areas and volumes of cubes and rectangular prisms—measurement of cylinders, cones, and spheres, all similarly expressed by symbols—exercises on wages, income and expenditure, simple trade accounts, rates, insurance, methods of measuring plastering trade quantities. *Elementary Drawing:* Freehand sketches from models—making dimensioned sketches of simple objects and details of plaster work—preparing working drawings from such sketches or from sketches supplied—simple problems in plane and solid geometry, with applications to plasterers' work. *Science and Materials:* Simple mechanics, with illustrations on stability and on use of hoisting appliances—materials used in plastering, their properties and uses—simple experiments to illustrate the chemical changes which take place during the manufacture and use of plastering materials—the various limes used in candidate's neighbourhood and elsewhere—rich and poor limes, hydraulic and non-hydraulic limes—methods of making, slaking, and testing limes and of making mortar for various purposes—plaster of Paris, its nature, origin, preparation, and methods of use—nature of plaster substitutes, Keen's, Parian, Sirapite, and asbestic plasters, and the special purposes for which each is used—reasons for the defects which arise where these plasters are improperly used—natural and artificial cements, their properties and use for external and internal purposes—gauging, testing, and using Portland, Roman, Medina, white and slag cements—mixtures of limes, plaster and cements—the purposes and methods of such admixtures with the dangers arising therefrom—other materials used in plastering, sands, hair, laths, oil mastic, and water-proofing compounds.

Tools used—various limes and suitability for different work—sands: preparation and admixture with limes and cements—substitutes for sands—lathing internal walls, ceilings and partitions—preparation of bracketing for plasterers' work—preparing brick and stone walls for plaster—fibrous plaster—Portland cement—Keen's Parian, Admant, Marbalite, Sirapite and other cements—cast concrete work—mixing, tempering and manipulating—cutting moulds—moulding and casting in plaster wax, gelatine, sulphur and Phelps' metal—piece moulding—moulding from life—moulding from high relief and the round—Scagliola making and polishing—materials, quantities and manipulations for Sgraffito work—pouncing, cutting and clearing out—gesso, composition, carton-pierre, fibrous plaster, plain face and fibrous slabs—modelling in clay, plaster stucco, gesso and cement—description and drawing of observed examples of work. *Quantities and Estimating:* Measuring plaster work, quantities of materials required for given areas, simple bills of quantities of plaster work, methods of estimating for plaster work.



PLASTERERS' WORKSHOP.
Practice in Solid and Fibrous Plaster Work.

FIRST YEAR COURSE IN PAINTERS' AND DECORATORS' WORK.

Subjects:

1. PAINTERS' AND DECORATORS' WORK.
2. DRAWING AND DESIGN.

PAINTERS' AND DECORATORS' WORK.

FIRST YEAR.

Object in painting surfaces—principles underlying the use of paints—names, description and uses of brushes and other tools—care and preservation of these—the principal pigments, thinners and driers used in painting. *Preparation of Grounds for Painting*: stopping, filling up, and surfacing. *Plain Painting*: simple mixing and application. *Distemper*: composition, application and preparation of grounds—graining and the preparation of grounds. *Sign Writing and Lettering*: principal styles of lettering and their forms and names—setting out of simple signs—dimensions of paper-hanging—preparation of pastes—the preparation of walls—stripping and hanging of ordinary papers.

TEXT BOOK.—Ellis Davidson: House Painting, Graining, Marbling, and Sign Writing for all Classes.

DRAWING AND DESIGN.

FIRST YEAR.

See Syllabus under Third Year Course.

SECOND YEAR COURSE IN PAINTERS' AND DECORATORS' WORK.

Subjects:

1. PAINTERS' AND DECORATORS' WORK.
2. DRAWING AND DESIGN.

PAINTERS' AND DECORATORS' WORK.

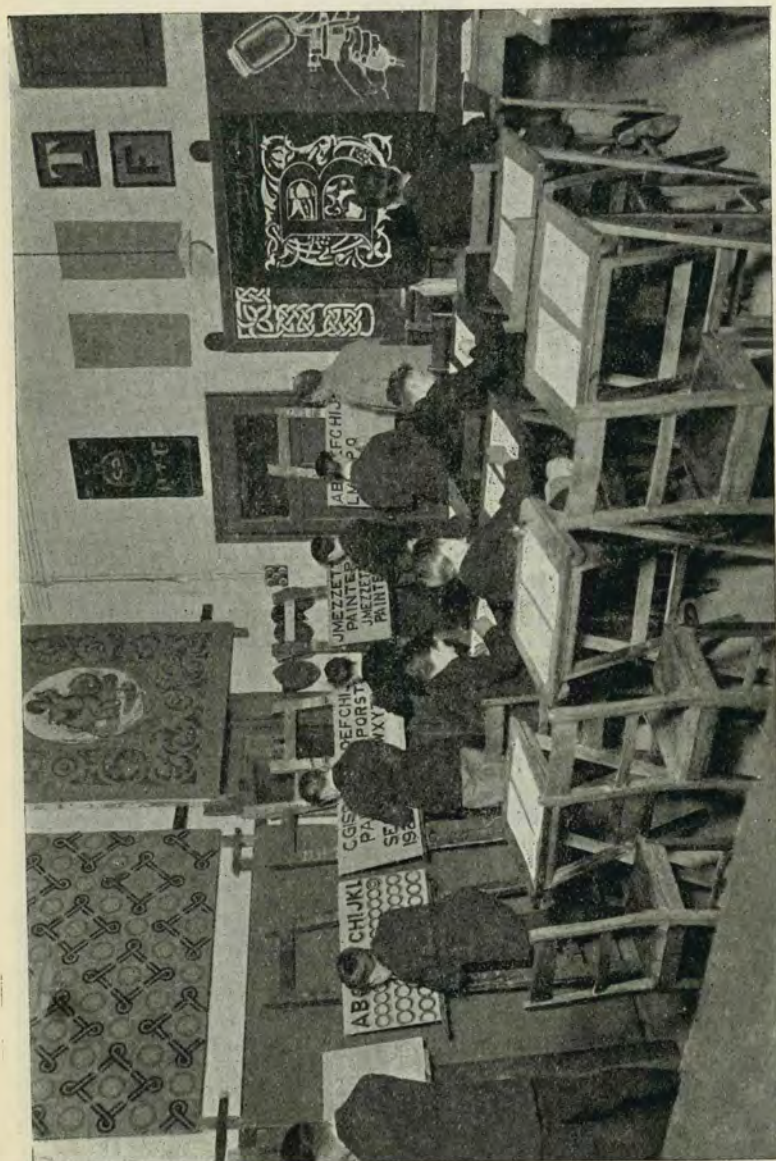
SECOND YEAR.

Faults in painting and their avoidance—preservative and decorative aspects of painters' work—economy in working—cleanliness in working—composition of, and the material used in, painters' brushes—use of plant and appliances—oils and dilutents: the properties, qualities and uses—driers: their composition, nature and action—permanence and fugacity of pigments—washable and firm distempers—water paints; limitations—selection of papers for walls and ceilings—setting out for and hanging relievo materials—artistic use of graining and marbling—grounds and methods of working—graining of different woods: oak, walnut, etc.—notice and advertising lettering—elaboration and emphasising of lettering, flattening, enamelling, etc.—woods suitable for staining—preparation and application of stains—faults in varnishing and their cure—mixed tints and colours—general hints on paint mixing.

DRAWING AND DESIGN.

SECOND YEAR.

See Syllabus under Third Year Course.



PAINTING WORKSHOP—LETTER WRITING.

THIRD YEAR COURSE IN PAINTERS' AND DECORATORS' WORK.

Subjects:

1. PAINTERS' AND DECORATORS' WORK.
2. DRAWING AND DESIGN.

PAINTERS' AND DECORATORS' WORK.

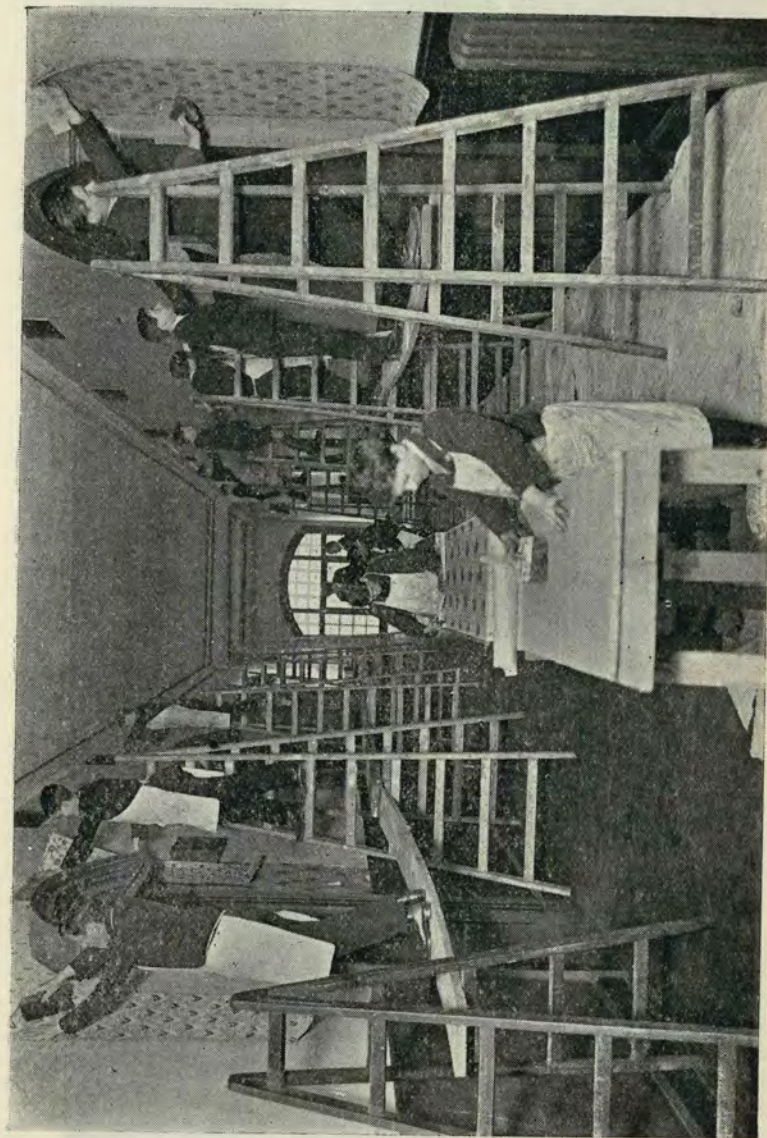
THIRD YEAR.

Selection of plant and tools for jobs, the testing of steps, ladders, etc.—arrangement of scaffolding for painters—testing colours, pigments, oils, turpentine and driers—quantities for given work—action of successive coats of paint upon preceding coats—arrangements of men when painting large surfaces—painting ornament, and gilding on distemper—use of distemper on other than plaster grounds—stencilling—punctuation, gilding and preparation of grounds, etc., for sign-writing and lettering—use of imitative effects of material and texture such as bronze, ivory, etc.—representation of inlays, marqueterie, etc.—polychromatic stencilling—matt and burnish gilding, etc.—chemical staining—preparation of stain—comparative value of water, oil and spirit staining—colour values and qualities—how to decide a colour scheme—selection and hanging of special papers, such as textile fabrics, imitation leather, Japanese grass cloth and relief materials. Measurement of painter's work, quantities and pricing.

DRAWING AND DESIGN.

FIRST, SECOND AND THIRD YEARS.

Designs for friezes, dado borders, string courses, plasters, panels, corner pieces, breaks, centres, diapers—heraldic devices—ornamental lettering, short texts to scale—drawings for imitation of inlaid woods and marbles—rough sketches for schemes of decoration—scales and working drawings for schemes of decoration—working out sketches with measurements taken from existing buildings, and setting to given scale—drawing of historic ornament—sketches of Lunette, Cartouche.



PAPERHANGING CLASS.
Practice in Institute Corridor.

FIRST YEAR COURSE IN CABINET-MAKERS' WORK.

Subjects:

1. CABINET-MAKING (DRAWING AND LECTURE).
2. CABINET-MAKING (PRACTICAL).

CABINET-MAKING (DRAWING AND LECTURE).

FIRST YEAR.

Nature and properties of various kinds of wood used in cabinet-making, with ports or places from which they are obtained—most suitable woods for construction—groundwork and veneers—best methods of seasoning and preparing for use—cabinet-making tools—names and uses—plain joints: dowelling, tongueing, dovetailing—methods of setting out and constructing mouldings; different names—preparation of working drawings—veneering surfaces—proper use of veneer—preparation of grounds and veneers, with methods of making wood stand after veneering—cabinet brass-work; hinges, joint stays, bolts and locks—methods of fixing and their different advantages—methods of measuring and setting out shaped window seats, cornice poles and drapery laths—hints with regard to the fitting up and completion of furniture for the showroom.

TEXT BOOK.—Bitmead: Cabinet-making.

CABINET-MAKING (PRACTICAL).

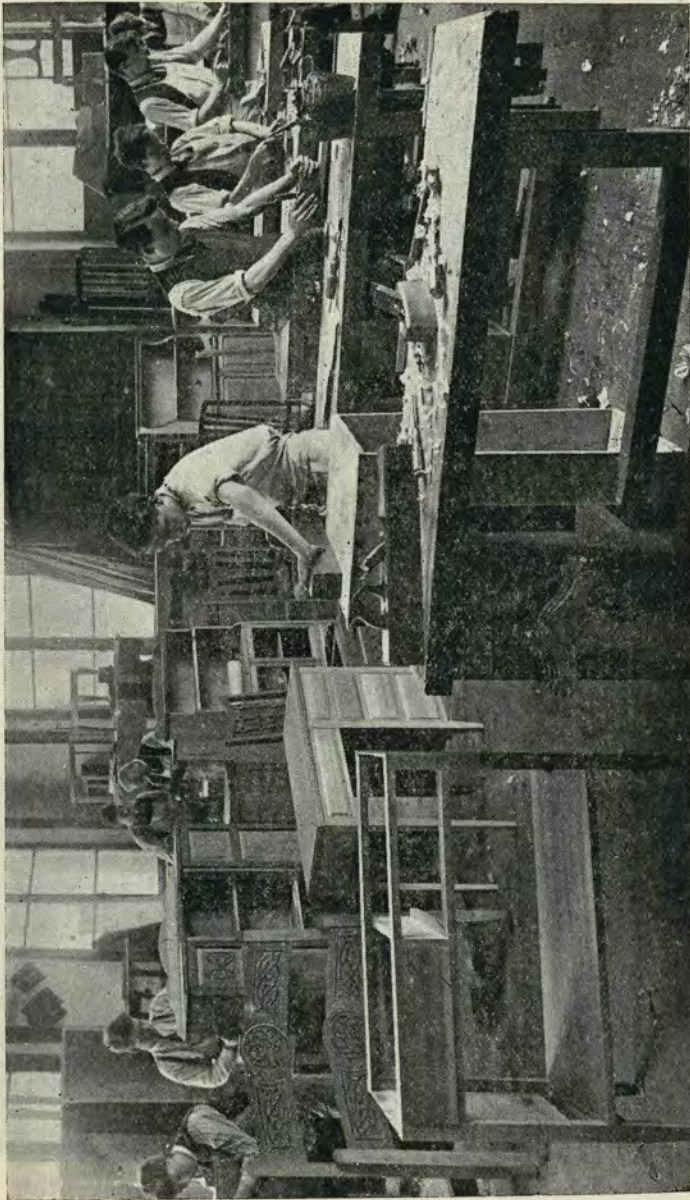
This Class forms part of the Course and must be taken in conjunction with the Drawing and Lecture Class in Cabinet-making.

The object of this Class is to afford the Student an opportunity of applying in a practical manner the knowledge gained at the theoretical and drawing lessons.

FIRST YEAR.

Tools: principles underlying their construction—proper method of sharpening and using—making of joints as used in cabinet work, including dowelling, tongueing, dovetailing—construction of simple mouldings by hand—preparation of machine-made mouldings for the polisher. *Veneering:* preparation of groundwork—veneering with caul and hammer, including rails and panels in straight and curved work, cross-banding circular rims, cleaning up veneered surfaces—proper methods of affixing hinges, joint stays, bolts and locks—fitting up furniture for the showroom, including proper methods of fastening glass—proper methods of affixing cornice poles, window seats, and cosy corners.

The necessary tools and timber will be provided by the Schools.



CABINETMAKING—DAY APPRENTICES.

SECOND AND THIRD YEAR COURSE IN CABINET-MAKERS' WORK.

Subjects:

1. CABINET-MAKING (DRAWING AND LECTURE).
2. CABINET-MAKING (PRACTICAL).

CABINET-MAKING (DRAWING AND LECTURE).

SECOND AND THIRD YEARS.

Nature and properties of the various kinds of wood used in cabinet-making, their suitability for decorative work, their diseases and how to minimise their effect before and after being converted into furniture—mechanical actions, such as are used in cylinder fall desks, writing tables, dumb waiters, etc.—different methods of expanding dining tables—cabinet brass work: hinges, joint stays, bolts and locks—best methods of fixing—inlaying and veneering with tortoiseshell, ivory, mother-of-pearl, and metals—preparation and methods of applying veneers to flat and sweep work—styles of furniture and the periods to which they belong—joints: plain copper, dowelling, tongueing, and dove-tailing, secret lap and secret mitre dove-tailing—methods of setting out—construction of working drawings from student's own designs.

TEXT-BOOK.—Bitmead: Cabinet-making.

CABINET-MAKING (PRACTICAL).

In this Class difficult pieces of Cabinet work will be undertaken, and the complete setting out and working of pieces of furniture.

SECOND AND THIRD YEARS.

More advanced work on the First Year Course, and, in addition:—

Inlaying and veneering with tortoiseshell, ivory, mother-of-pearl, and metals—preparation of ground work and veneering of difficult pieces of cabinet work—making of joints, such as secret lap and secret mitre dovetail, knuckle rule, and finger—construction of difficult Roman and Grecian mouldings by hand.

Students taking the City and Guilds Final Examination in Cabinet-making will find this Class suitable for the construction of the specimen of practical work to be submitted to the Examiners.

The necessary tools and a supply of ordinary timber will be provided by the Schools.

TEXT-BOOK.—Bitmead: Cabinet-making.

COURSE IN UPHOLSTERY.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE AND PRACTICAL WORK.

FIRST AND SECOND YEARS.

Proper preparation of framework for upholstering. *Materials used:* Leather, leather-cloth, velvet, saddle-bags, tapestry, rexine, lace, etc.—use of springs—upholstering to suit various styles of furniture treatment of couches, sofas, settees, and chairs of various kinds—re-upholstering old work—re-conditioning of old materials—enamelling old frames for necessary repairs—tools and appliances used in upholstery.

WOOD-CARVING.

The course of instruction in Wood-carving includes a lecture and drawing class on one evening, practical work on one or two evenings, and a suitable Art class in drawing and design on another evening. The practical work will be of a progressive nature and selected in each case to suit the skill of the individual student.

FIRST YEAR.

The use and names of tools used in wood-carving—sharpening of tools—stones employed—various woods made use of—treatment of the different classes of wood—the influence and effect of grain—setting out and starting a piece of work—first stage in the working of a pattern—second stage in the working of a pattern—modelling the work—finishing the work—simple patterns of carving with one or two tools—ornamental forms in soft and hard timber—carving in flat and broad treatment in yellow pine—carving in hard timber and how to treat same—simple panels from casts—conventional foliage in different styles from cast—natural forms of foliage—how to treat practically in wood—geometrical patterns and freehand ornament contrasted in their application to furniture and architectural work.

SECOND AND HIGHER YEARS.

The work of the Italian Renaissance explained and examples given—the French Renaissance explained—natural foliage and geometrical treatment—the Gothic periods—Norman periods—Early English period—decorated period—perpendicular styles—examples of architectural treatment—carvings as applied to furniture—individuality of style explained and examples given.

COURSE IN COACH AND MOTOR-CAR BODY BUILDING.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL WORK.

FIRST AND SECOND YEARS.

Construction of scales and their use—timber used in Coach Building and Motor Body work—measuring and valuing—natural and artificial seasoning, and the use of bent timber—iron and steel: process of forging and welding—how to tell the quality of steel and iron—precautions when forging or tempering various kinds of iron and steel—aluminium and other metals used for panels, wings, etc.—Designing and drawing side view, plan and back view of carts, waggonettes, landaus, victorias, broughams and other carriages, open or closed, and motor bodies—designing, drawing and making joints in coach-building—sizes of poles, bars and shafts for various horses or ponies—position of tug stops and staples, etc.—varieties of undercarriages—wheels with wooden spokes, including artillery patterns—sections of hubs, spokes and tyres, channels, pneumatic tyres, etc.—sizes and shapes of axles and springs and motor axles—spring making and methods of testing springs and axles; setting them true and fixing—shock absorbers—ironwork on bodies and carriages—lever brakes—foot brakes—wind screen—ironwork for luggage, tyre carriers, grids, etc.—tools used by body builders: sketches and descriptions—common workshop appliances and machinery—designing and drawing all kinds of motor bodies—making working drawings for use in the shop, such as drawings of ironwork, sections of framing and of naves—calculating the sizes of wheels, springs, axles, and the quantity of timber required—writing out workshop orders—specifying the work to be done to a carriage or motor car when worn or damaged—estimating the cost of repairs—the general principles of costing—remedying of defects such as noise or vibration—methods of overcoming difficulties of construction, as in making folding hoods and seats, movable canopies and brougham tops, landalette pillars and door tops.

COURSE IN COACH PAINTING.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL WORK.

FIRST AND SECOND YEARS.

Painting: materials used and process of painting and varnishing—preparation of paint from crude or dry colour—properties of oils, varnishes and other materials used—lettering, crests, etc.—tools used by painters, care and use—workshop appliances.

COURSE IN COACH TRIMMING.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE AND PRACTICAL WORK.
FIRST AND SECOND YEARS.

Trimming materials: leather, cloth, lace, etc.—methods of sewing, stuffing, etc.—marking out materials, especially with a view to appearance and economy—flat and curved work—tools and appliances employed.

COURSE IN RAILWAY CARRIAGE AND WAGON BUILDING.

The Course will occupy two Sessions.

GENERAL SYLLABUS—LECTURE, DRAWING AND PRACTICAL WORK.
FIRST AND SECOND YEARS.

Construction and use of scales—principles of projection—making detail drawings of standard wagons—freehand sketching of details—proper proportioning and dimensioning. Drawing and specifications of open goods wagon. Description and properties of cast iron, wrought iron, mild steel, cast steel malleable cast iron—manufacture and machining qualities—suitability of these materials for various purposes. Explanation of hand tools and simple machines used in saw mill, body and finishing shops. Description of timbers used in carriage and wagon construction—characteristics, seasoning, shrinkage, and defects of timber. Explanation of loading gauge, as regards limitation to size of rolling stock. Working drawings of wagon underframes—study of carriage and wagon component parts—block plans with seating accommodation of various types of carriage—different types of wagon stock in common use. Elementary treatment of trimming, painting, and finishing.

COURSE IN WOODCUTTING MACHINERY.

Subjects:

1. WOODCUTTING MACHINERY (THEORY AND PRACTICE).
2. PRACTICAL GEOMETRY AND CALCULATIONS.

The Course will occupy two Sessions.

WOODCUTTING MACHINERY (THEORY AND PRACTICE).

FIRST AND SECOND YEARS.

General Woodworking Machinery covering the following branches:—

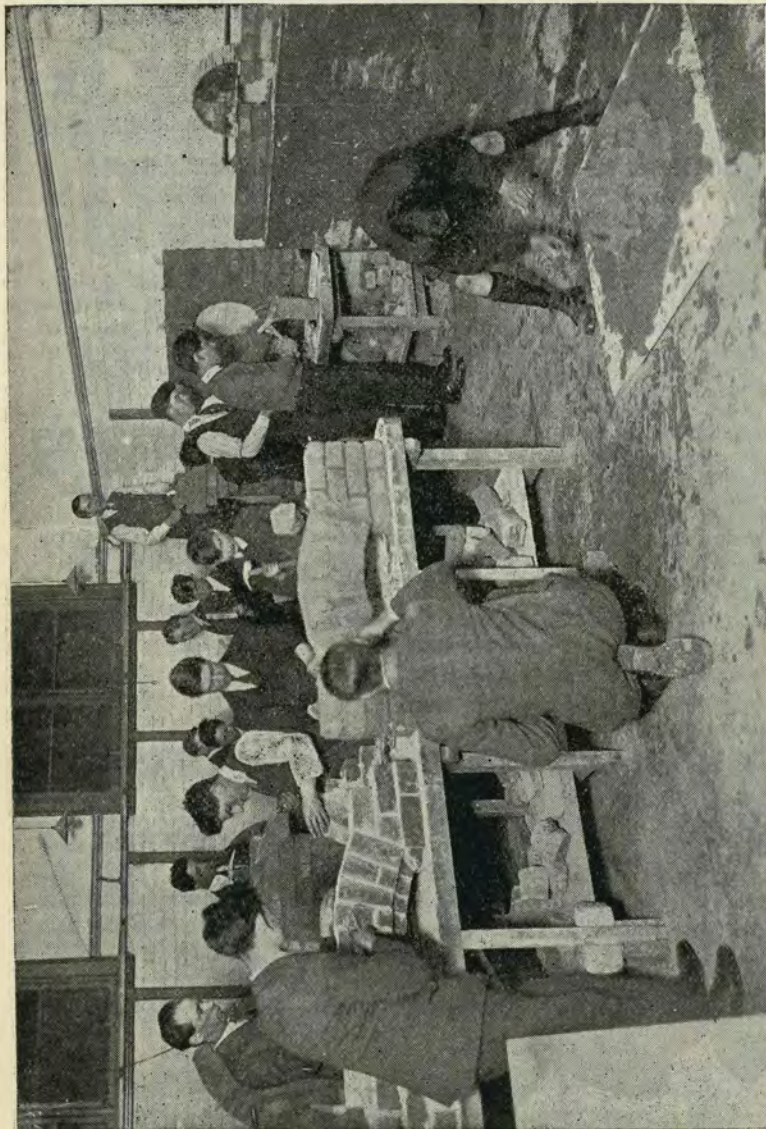
Saw Mill Work: circular sawing (feed and hand)—deal frame sawing—log frame sawing—four cutter moulding machine.

Joinery, Machine Work: planing machines—bandsawing machines—three cutter moulding machines—spindle moulding machines (French and English)—tenoning and scribing machines.

Shop Fitting and Cabinet Machine Work: spindle moulding (French and English)—handsawing—fretsawing—circular sawing—mortising.

GENERAL.

Making cutters for specific purposes—bandsaw brazing, jointing and sharpening—brazing and tempering—circular saw sharpening and setting—belt stitching and lacing—belt jointing—machining of doors—drawing; economical conversion of timber—cutter balance and setting up of machines—preparation of cutters and running of mouldings of all kinds—grooving, tenoning and mortising.



BRICKLAYING CLASS.
Arch and Niche Construction, etc.

FIRST YEAR COURSE IN BRICKLAYING.

Subjects:

1. BRICKLAYING (DRAWING AND THEORY).
2. BRICKLAYING (PRACTICAL).

BRICKLAYING (DRAWING AND THEORY).

FIRST YEAR.

Bricks: Essentials of ordinary building bricks—well-known varieties—practical tests—approximate weight and dimensions. *Mortars:* cements, limes, sand and other ingredients—proportions—preparation and mixing. *Concrete:* ingredients—proportions—preparation and mixing. *Foundations:* concrete and brick footings—cause and prevention of dampness in buildings—land drains. *Terms and Processes:* meaning of various terms used—function of mortar—effect of thickness of joints—strength and durability—approximate costs. *Bonding:* necessity for bond—various systems of bonding—value of these systems in regard to stability, economy and appearance. *Pointing:* various methods—advantages and disadvantages of the different methods—composition of pointing mortars. *Brick Arches:* object of arches—different types—bond in arches—setting out of the various types. *Elementary Principles of Statics as affecting Brickwork:* calculation of weight—determination of pressure. *Measurement of Work and Materials:* amount of excavation required—volume of concrete and brickwork in foundations and footings expressed in rods, super or cubic yards—quantities of materials required for a particular piece of work—geometry as applied to bricklayers' work.

BRICKLAYING (PRACTICAL).

FIRST YEAR.

Methods of bonding in walls of various thicknesses—preparation of foundation and footings—position of damp-proof courses—position of vents—laying and jointing of drain pipes—pointing a piece of brickwork in various ways—cutting of simple arches—cutting the skew-back—simple weathering to buttresses—corbelling—junctions of walls—plain tiling.

SECOND YEAR COURSE IN BRICKLAYING.

Subjects:

1. BRICKLAYING (DRAWING AND THEORY).
2. BRICKLAYING (PRACTICAL).

BRICKLAYING (DRAWING AND THEORY).

SECOND YEAR.

Bricks: essentials of facing bricks—method of testing—hand-made and machine-made bricks—well-known varieties, local and other. *Mortars and Concrete:* more intimate knowledge of these materials—effect of frost and rapid drying—waterproofing—object of steel reinforcement—correct fixing of reinforcing bars. *Bonding:* application of the systems to obtuse and acute angles, reveals and jambs—special bonding—broken bond—bonding in hollow walls and curved walls—copings—cutting to gables over arches—brick paving. *Domestic*

Chimneys and Fireplaces: dimensions, form and course of fireplaces—prevention of smoky chimneys—bonding of stacks—grouping of flues and construction of fireplaces. *Walls of Brick and Stone:* adding new work to old—chase-bonding—block-bonding—toothing—metal ties. *Roof and Weather Tiling:* plain tiles—pan tiles—characteristics of good tiles—floor tiles. *Arches and Gauged Facings:* setting out of elliptical and other arches—gauged brickwork in walls and piers—moulded brickwork. *Drains:* essentials of good drain pipes—course, fall and construction of drains—construction of manholes and inspection shafts—fixing of gullies. *Stability of Walls and Piers:* principle of moments—graphical representation of forces in one plane—centres of gravity of walls, buttresses and retaining walls—safe loads on brickwork and concrete—bearing power of various soils and safe loads—usual modes of measuring any of the work comprised in the foregoing—geometry as applied to bricklayers' work.

BRICKLAYING (PRACTICAL).

SECOND YEAR.

Bonding: various systems of bonding in obtuse and acute angles—bonding in rebated jambs—special and broken bonding—hollow walls—curved walls—cutting and bonding in elliptic and other arches—cutting brickwork over arches—cutting to gables. *Bonding in Chimney-breasts, Fireplaces and Flues:* gathering of flues—setting of kitchen range and register grate. *Preparation of Gauged Arches with piece of gauged face-work:* use of moulded bricks in panels, string-courses and cornices—construction of manholes and inspection shafts—laying and jointing of drain pipes and connecting up to gullies and soil pipes—preparation of reinforced concrete lintel—constructing a small egg-shaped sewer. *Tiling:* plain and ornamental—bonding buttresses and building inverted arches.

Practice will be afforded in setting out pieces of brickwork from architectural drawings.

COURSE IN MASONRY AND STONECUTTING.

FIRST AND SECOND YEARS.

Geometry: Simple examples of the application of Plane and Solid Geometry to Masonry. Explanation of simple terms used in masonry. Use of scale. *Mouldings:* Names and descriptions—enlarging and diminishing. *Arches:* Historical development—method of setting out. *Moulds:* Preparation of moulds of various kinds—mensuration applied to masonry. *Walls:* Various kinds—rubble, Ashlar and composite—securing same against damp. *Windows:* Mullioned and corbelled. *Stairs:* Straight and geometrical—points in stairs and landings. *Stone:* Simple description of limestone and sandstone—quarrying. *Tracery Windows:* Setting out—history and development. *Mouldings:* Simple and complex—polygonal bases, columns and caps. *Materials:* Care in selection, method of booking and ordering. *Appliances:* Description—method of using. *Circle-on-Circle Work:* Difficulty of Construction—precautions in fining. *Roofs:* Construction of Simple Stone roofs for porches.

COURSE IN GEOMETRICAL HANDRAILING.

(Open only to Journeymen Carpenters.)

The accommodation available for this course being limited, preference will be given to applicants who are past students of the Schools. Those who wish to secure a place should make early application.

SYLLABUS.

Setting out wreath for quarter circle plan—method of obtaining the face mould and bevel—practical work—cutting wreath from the plank, bevelling, squaring, and moulding—setting out wreath for semi-circular plan—arrangement of risers—how to obtain the face moulds and bevels for equal and unequal pitches—cutting wreath from the plank, bevelling and squaring, joining to straight rail, etc.—setting out terminal scroll and wreath—method of obtaining bevels, face moulds and falling lines, jointing and moulding complete—setting out wreath over quarter space of winders; obtaining face mould and bevels; working and moulding wreath—setting out wreath for ship's stair, with quadrant well and level landing, the wreath being in two pieces.

Students will require to provide themselves with the ordinary drawing instruments and drawing paper. The Schools will supply the necessary woodworking tools and timber.

COURSE IN BUILDERS' QUANTITIES.

The Class is intended to supply a course of elementary instruction in Quantity Surveying as practised in Dublin and District, to Architects', Surveyors', and Builders' pupils and assistants, and others engaged in the building trade. Intending students should have a practical knowledge of Building Construction and Drawing, and be versed in the elements of mensuration. Instruction will be given in the usual methods of taking off, abstracting, and putting into estimating form, the materials and labour required in the various trades.

The instruction will be given mainly by lectures illustrated by blackboard sketches; in addition, questions for homework will be set weekly.

Students will be required to provide themselves with a set of paper scales.

SYLLABUS.

Quantities and Specifications: general explanation of both, with their essential differences. *Taking off*: explanation and description of various methods of taking-off, with simple examples; squaring dimensions.

Abstracting: explanation; general hints and simple examples reducing the alternative estimates. *Billing and Pricing*: explanation; general hints and simple examples.

The mode of measurement and description of the following:—

Excavator and Drainer: excavations over surface, and for basements and trenches; disposal of material; strutting and planking—drains; pipes, bends, junctions, traps, inspection chambers, connections to sewers. *Bricklayer*: concrete in foundations; floors and walls; common brickwork, including party walls; chimney breasts; boundary walls; openings; battered and circular work; work in cement; damp

courses; pointing; cuttings; beam filling; trimmer and relieving arches; facings; moulded courses, etc. *Mason*: rubble walling; wallstone and ashlar facing; dressings, including plinths, sills; strings, cornices, copings, heads, templates; flagging steps, square and spandril; hearths; landings. *Carpenter and Joiner*: centring; floors; roofs; partitions; windows; doors, staircases, etc. *Ironfounder and Smith*: cast-iron work in pillars; pipes; beams and gutters; rolled and built steel girders; and iron roofing. *Slater and Tiler*: straight; circular and vertical; eaves course; cuttings; ridges; hips and valleys. *Plumber and Zinc Work*: flats; gutters; cisterns; flashings; bends; stock gutters and pipes in cast-iron; bath and lavatory fittings, etc. *Glazier*: sheet, ground, rolled and polished plate and lead lights. *Plasterer*: lime-washing walls; rendering on walls; lath and plaster ceilings and partitions; cornices; enrichments; soffits; cement dados and skirtings. *Painter*: Painting on walls, wood and iron, external or internal; graining, staining, varnishing, and lettering.

TEXT BOOK.—W. E. Davis: Quantities and Quantity Taking.

COURSE IN LAND SURVEYING AND LEVELLING.

The Course is intended to give a sound theoretical and practical knowledge in surveying, to give facility in the use of the various instruments, in plotting surveys, and in making finished plans. It will be found of service to Engineers' and Architects' Assistants, Auctioneers, Land Agents, and others, as well as for the examinations of the Surveyors' Institute, the Institution of Civil Engineers, the Auctioneers' Institute, etc. It also covers much of the work required for the various foreign examinations for surveyors.

The Course will comprise about *eighteen* lectures and *ten* practical demonstrations—some devoted to field work, and some to office work. The dates and places for the field work will be announced in class as the course proceeds.

All apparatus and instruments for field work are provided by the Schools, but students must provide their own plotting scales, survey book, level book, drawing instruments, and materials.

SYLLABUS.

Surveying with the Chain: object in making a survey—apparatus used: chain arrows, rods, etc.—testing chain for length—measures of length and area. *Simple Surveying Operations*: ranging a line, fixing position of a point relative to a line, setting out a perpendicular to a line, connecting points invisible from one another—optical square. *Chaining*: duties of leader and follower—chaining on slopes—stepping—clinometer. *Simple Surveys*: stations—main lines—triangles, well and ill conditioned—offsets—offset rod—methods of dealing with fields, town plots and small estates of regular or irregular outline, obstacles, such as buildings, lakes, rivers. *Booking the Survey*: forms of field book—methods of entering the notes—conventional signs. *Magnetic Compass and Magnetic Bearings*: variation of the compass—prismatic compass. *Traversing with Chain*: setting out curves. *Levelling*: instruments employed; level—construction of telescope—level staff—Abney level—clinometer—aneroid barometer. *Simple and Compound Levelling*: bench marks—datum line—curvature of earth—refraction. *Methods of Booking Levels*: rise and fall methods—collimation method reduction of levels and method of checking—check levels. *Sections*: cross sections and longitudinal sections—working sections. *Plotting Sections*: horizontal and vertical scales—information required on the plotted section. *Principles of Contouring, Permanent Adjustments of Level*: office work—scales—meaning of representative fraction—scales used on ordnance plans—plotting scales. *Materials* required, such as brushes, colours, instruments—plotting the field notes—mode of procedure—styles of writing and printing—north points—colouring—ornament generally—preparation of finished plans. *Copying Plans*: tracing—heliography—enlarging and reducing—pantograph. *Mensuration of Areas*—method of triangles—method of ordinates—Simpson's rule—planimeter—computing scale.

An examination in the theory and practice of surveying will be held at the close of the course, and certificates will be awarded to successful students.

COURSE IN MANUAL INSTRUCTION (WOODWORK).

The main objects of the Class are to afford a training in the proper use of woodworking tools, to give a knowledge of the proper proportion and suitability of joints for different purposes, to enable students to make articles of domestic, personal, or other use, and to provide a medium for the learning of mechanical drawing and sketching.

FIRST YEAR.

Drawing: Simple projection, as required for the working drawing of each model. *Woodwork*: Exercises in planing, sawing, and chiselling—Making of woodworking joints—Models of a useful nature, involving the use of these joints. *Theory*: Construction of the various tools, grinding and sharpening of edged tools. *Timber*: Woods in common use, growth, sources of supply, nature and properties; seasoning of timber.

SECOND YEAR.

In this year of the course the work will be chiefly the making of models of a utilitarian nature, and students will be allowed some freedom in their choice of models.

The necessary tools and timber are provided by the School.

MECHANICAL DRAWING, PATTERN CONSTRUCTION AND GEOMETRICAL DESIGN.

The course is arranged so that students may become acquainted with the use of instruments, T square, set squares, compass, scales, etc., and the principles of construction of ordinary geometrical figures—special reference will continually be made to the application of geometry to the different branches of industrial art, such as designing, etc. The exercises worked in class will include the drawing of geometrical patterns—spacing of wall and other surfaces for decorative purposes—bands and borders—units of pattern—diapers—the construction of arch-forms—tracery and mouldings. In addition, exercises will be given in the projection of simple solids.

FRENCH POLISHING.

FIRST AND SECOND YEARS.

The art of French polishing—manufacture and use of various stains and polishes—colouring and lacquering—varnishing and glazing—gums and their use—colours and their use—aniline dyes and chemicals used in stains—methods of polishing different woods, wooden carvings and statues—imitations, inlay transfers, papers, various methods of polishing; German, Scotch, English, American, Swedish and French.

IRISH LANGUAGE.

All Students of the Schools are entitled to attend a class in Irish if they so desire, without extra charge. Classes in the First Year only are held in the Bolton Street Institute, but more advanced students will be provided with instruction in any stage at the Technical Institute, Parnell Square, or Kevin Street.

IRISH.

FIRST YEAR.

Oral: Conversation lessons (questions, answers and general remarks) to afford each student the necessary practice to attain reasonable fluency in conversing on simple matters such as the following:—Name and home or residence—salutations on meeting and parting—the clock—the days of the week—months and seasons—the weather—money—easy counting—colours and other ordinary properties of common objects—location of objects in the classroom and immediate neighbourhood—parts of the body and clothing—giving and carrying out simple orders. With the conversational lessons, the student will be familiarised with the ordinary constructions in regard to the use of *is*, *seadh*, *ni headh*, *an eadh*, *nach eadh*, *gurb eadh*, *sé*, *ni hé*, *an é*, *nach é*, *gurb é*, *cad é*, *an bhfuil*, *nil*, *tá*, *go bhfuil*, *nach bhfuil*, *an raibh*, *ni raibh*, *bhi*, *go raibh*, *nach raibh*; and of some of the more commonly used verbal nouns, such as *suidhe*, *seasamh*, *teacht*, *siubhal*, etc.

Written Work: Each Student will keep a note-book to record salutations, simple phrases, his own name and address, etc., in correct Irish. Rough notes may also be written according to English phonetics or otherwise to aid in the memorising and pronunciation of words and phrases.

Cultural: Students will be taught to memorise simple songs, rhymes, stories, recitations, etc., so as to be able to repeat them with correct *blas*. Verses, etc., will be according to Gaelic metres, and stories or recitations by Gaelic authors.

TEXT BOOK: *An Tárú Breac*. Dr. Hyde.

CLASS IN PLAN DRAWING AND READING.

This Class is suitable for clerks in architects' and builders' offices, auctioneers, land agents, those engaged in insurance work, heating, engineers, and others.

FIRST YEAR.

Drawing instruments, general setting out and arrangement—construction and use of scales—lettering in simple form—use of protractor—construction of triangles and quadrilateral figures—calculation of area, etc.—relation of diameter to circumference of a circle; area of circle—segmental and elliptic curves—simple scale drawing—drawing to scale plan of small building—simple development of surfaces—drawing, plans, elevations and sections.

SECOND YEAR.

Scale drawing, plans, elevations and sections of dwellings (bungalow and larger types) with all window and door opens, chimney breasts, floors, roofs, etc., etc.—plans, elevations and sections of public buildings, i.e., public offices, schools, barracks, etc.—drawing site maps showing out-offices, boiler-house, etc., etc.—large scale details of some of the methods of construction in old and modern buildings—exercises in tracing, inking and colouring some of the foregoing drawings.

PRELIMINARY COURSE.

Subjects:

ENGLISH.

ARITHMETIC.

DRAWING.

This Course is arranged for junior trade students who have had to leave school while still in the lower standards, in order to provide them with the opportunity of qualifying for the Introductory and Specialised Courses. Students are permitted to take a practical class in their trade subject by payment of an extra fee, provided there is room for their admission.

ENGLISH.

Spelling, correct pronunciation and grammar—formation of sentences—use of verbs, adverbs, prepositions, etc.—simple descriptive compositions.

ARITHMETIC.

Multiplication tables—simple multiplication and division—easy compound addition, subtraction, multiplication and division—simple mental arithmetic.

DRAWING.

Simple freehand sketches from blackboard, familiar objects and from memory—geometrical exercises with compass and set squares—angles, squares, rectangles, circles, etc.

